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MANILA, P. I.



#### The Bank of the Philippine Islands

(ESTABLISHED 1851)

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J. ELMER DELANEY, 1st Vice-President
FULGENCIO BORROMEO,
2nd Vice-President

D. GARCIA, Cashier RAFAEL MORENO, Secretary O. M. SHUMAN, Chief, Foreign Dept.

BRANCHES: ILOILO AND ZAMBOANGA

Authorized Capital					(Pesos)	10,000,000.00
Capital fully paid-up						4,500,000.00
Reserve Funds .						2,250,000.00

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New York: National City Bank and The Guaranty Trust Company

Paris: Comptoir Nat'l d'Escompte

Australia: Bank of New South Wales Shanghai: Yokohama Specie Bank, Ltd. Chicago: Continental & Commercial Nat'l

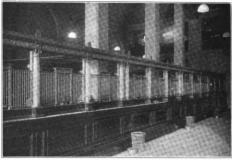
Japan: Yokohama Specie Bank, Ltd., The Bank of Taiwan, Ltd., The Sumitomo Bank, Ltd.

#### The Philippine National Ban

EVELOPMENT of the Philippine National Bank depends entirely upon the development of the Philippine Islands. said the founders of that institution, and upon the confession of faith they builded so well that the bank today is the richest of the members in the Philippine financial brotherhood.

The bank started out to create wealth in order that its banking business might thrive. There was none of the little gold-framed and time-honored motto business adopted at the birth of the bank, and there hasn't been any since. There has been no uncanny decimal diagram system devised for telling whether John Doe is "good" for the money. But there is an astonishing amount of investigation into whether a loan is going to increase the wealth of the country or not. If it is, nine chances out of ten a way is found for making the loan,-and, thus far at least, the bank hasn't lost anything through its

Then the bank developed other eccentricities that set the tongues of various Mother Grundys agog. Strangely enough, and in violation of staid and immemorial precedent, the bank officials were not half so anxious to plaster healthy mortgages on nice new business blocks as they were to provide the means for making something grow in uncultivated spots. There was lots of money to be made in exchange, and, incidentally, it is wonderful just how nearly synonymous those words "exchange" and "banking" have become in certain quarters of the Orient, but the bank, somehow or other, rather hankered to see ships coming into Manila Bay in flocks



RECEIVING AND PAYING TELLER WINDOWS

and droves, and the only exchange which occupied its serious attention was the regular commercial exchange of produce and manufactures for coin of the realm.

The result of this policy is that this institution, which is unique in many ways, now has as many agricultural experts as it has accountants, and these men can figure out next year's crop of sugar cane faster than any teller at any one of the dozen or more wickets can count silver pesos. Before the

federal farm loan system in the United States was arranged for by special legislation, the Philippine National Bank was jending money, almost if not actually, on the color of ratoon sprouts and the phraseology of the weather forecast. A man who had started to raise a crop on small capital was able to go to the bank and, if his representas tions were correct, to secure a fair portion of his prospective proceeds in good cold cash, whereas before he was left entirely to the tender mercies of the usurer and the latters' forty percent a month. It is not hard to imagine what the result of this policy has been. Hundreds of Philippine agricultural enterprises that could never have been launched but for the availability of cheap credit are now well on the road to success.

While the American congress was scratching its head and sitting up nights in an effort to devise an efficient medium of communication and information that would make the farm loan scheme workable, the Philippine National Bank already had a governmentcontrolled corps of agents in the various provincial treasurers, who could make prompt and accurate recommendations concerning the placing of farm loans throughout the islands. This was possible because of the fact that the Philippine government owns 51 per cent of the stock in the bank, and its officials in the field are thus made available as an advisory force. The organization of the National Bank resulted in the absorption by that institution of the Agricultural Bank, which had led a precarious existence for a number of years, and so acquired the



CREDIT AND COLLECTION DEPARTMENT

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STAIRWAY AND INNER COURT

services of all provincial treasurers, who had acted as agents of the old bank, and who had headquarters in the capitals of the various provinces of the archipelago. The intimate knowledge of local conditions possessed by provincial treasurers, whose offices contain up-to-date information, as to the assessment valuation of every piece of property in the province, has proved invaluable to the bank since its organization and may be considered as one of the most important factors, if not the most important factor, in its record as an auxiliary to Philippine agricultural development.

It must not be conceived that this newborn activity has not produced the inevitable storm of criticism. There has been the inevitable charge that the bank has been attempting to control this or that agricultural product, and at times, the business community has been patently distrustial, but always, when the true facts have become known, the bank has emerged stronger than ever before. And always, merely because its directorate still adheres rigidly to the original purpose, that of producing wealth where the islands have produced no wealth before.

As might well be expected from the fact that the charter granted the bank by the Philippine legislature provides that 51 percent of its stock shall be held by the insular government, the bank, in one sense at least, has become largely a government agency. Just as there is in the Philippines a government of the people, for the people and by the people, there is also a bank of the people, for the people, and in actual fact, a bank by the necoule.

When the United States entered the war against Germany, this bank became the logical medium for handling the Liberty Loan and War Savings Stamp campaigns throughout the Philippine Islands. In Manila, a special department for the handling of 'this work was installed on the ground of 'this work was installed on the ground.

floor of the bank, and each of the bank's provincial agencies became provincial headquarters for loan and war savings drives. The Liberty Loans were handled by the bank on the same basis as they were handled by the federal reserve banks in the United States. More liberal terms than the federal government could offer were accorded to subscribers, and, true to the best traditions of American banking, the service of the institution in the hour of need of the country, was furnished free to the Filipino people, irrespective of their customary banking con-

The bank itself has been the largest single subscriber to Liberty Bonds in the islands, and through its efforts and the publicity which it gave to the War Savings Stamp campaign last year, both these and Thrift

Stamps disappeared faster than they could be secured from the United States.

Today the bank is on the threshold of a greater career. In the past it has been a Philippine institution, but tomorrow it is destined to become an Oriental institution, and to furnish an organization which will connect the financial arteries of the Far East with those of the American nation, In American banking methods it is the peoneer in the Orient, while its New York branch furnishes an excellent means for affording the American business man the financial connections which his inevitable entrance into Oriental trade is certain to demand in the near future. Already a fully-equipped branch has been opened at Shanghai, China, and an agency at Vladivostok will be the next link forged in a chain that, in time, will cover the entire East. What the bank has done in the brief period

of its existence is but an earnest of what it will do in the future, and by its record in initiating those things which have aided so greatly in maintaining the prosperity of the Philippines it is possible to glimpse the vast field which it has conceived for it endeavors, Early in 1918, largely through the advantages derived from the close relationship existing between the bank and the Philippine government, the then-president, Mr. Samuel Ferguson, as a member of the special committee sent from the islands to represent their interests before the conservation and shipping boards, was able to accomplish great things for the archipelago, despite the stress and strain of war conditions. Philippine sugar, which filled the warehouses of the southern island ports and overflowed onto the wharves because of the lack of bottoms to carry it to the American markets. was at last placed aboard shipping board vessels sent to the Philippines in response to the urgent appeal of the bank, acting in the interest of the planters and the centrals.



MAIN ENTRANCE
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Other island products were also moved before conditions became ruinous for the producer. Thousands of tons of shipping were secured for Manila and other Philippine ports, and in addition it was largely through the efforts of the bank that the low rate of \$15 per long ton for sugar from the islands to the Pacific coast was secured. This low rate operated to overcome the natural disadvantages of distance and disproportionate tariff reduction, and there is now little question that, unless it had been secured, the major portion of the accumulated crop here would have, of necessity, have had to rot in the warehouses.

Similar campaigns in the interest of the hemp and tobacco producers of the islands have since been launched through the bank's initiative, and it was largely as a result of its efforts that a steady stream of tobacco leaf, cigars and cigarettes for the American markets and for the boys in the trenches in France was kept flowing. For the boys in France alone, 190,000 cigars, 3,349,000 cigarettes and well over half a ton of smoking tobacco were sent forward through the efforts of the bank and the cooperation of local tobacco dealers and manufacturers.

The Philippine National Bank is subject to inspection, at regular intervals, by the insular government auditor, and is also subject to the inspection of the insular treasurer at any time. It is the sole depository of the funds of the Philippine insular government and of the various provincial and municipal governments of the archipelago.

Following the passage of the act which gave it life, Dr. H. Parker Willis, secretary of the federal reserve board of the United States, was called to the islands in the spring of 1916 to effect its organization, and he was made the first president of the institution. His duties in connection with its organization and with its opening were performed while he was on leave of absence from his federal office structure. Plans have now been com-



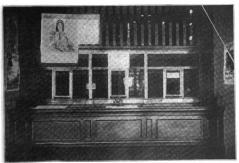
LOBBY

position, and it later became necessary for him to resign in order to resume his duties in the United States. He was succeeded by Samuel Ferguson, formerly secretary to Governor General Harrison, and upon Mr. Ferguson's death last year, General Venancio Concepcion, formerly deputy collector of internal revenue, was made president.

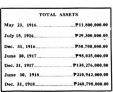
The bank was organized in 1916 and from May 2 until June 22 of that year the time was consumed in the preparation of adequate quarters and the training of sufficient personnel to perform the regular duties of the institution. The bank was located on the Escolta, the main business thoroughfare of Manila, and occupies a large portion of both ground and mezzanine floors of the Masonic Temple building, Manila's most modern

pleted for a new bank building which will cost in the neighborhood of \$2,000,000 and which will be the finest edifice of its kind in the Orient. Work on the new building, which will face the southern approach to the new bridge across the Pasig river named in honor of Congressman William Atkinson Jones of Virginia, author of the Jones law which is now the organic act of the Philippine government, will be commenced sometime this

Under its organic act the bank is required to set aside one-half of its net earnings each fiscal year for the creation of a reserve, and is also limited to the declaration of a dividend of 12 per cent on the par of its stock. During the first six months of its existence it declared a dividend at the rate of 9 per cent per annum, after meeting reserve requirements, and for the fiscal year ending December 31, 1918, the net earnings of the institution were in excess of 47 per cent on outstanding stock. Through the legal provision limiting the amount of the dividend which may be declared by the board of directors, a large surplus is being built up which has enhanced the value of the stock until at present it is selling in the neighborhood of P200 for each share of P100



LIBERTY BONDS AND W. S. S. Digitized by GOOSIC S. DEPARTMENT



# Philippine National Bank

MANILA, P. I.

CONDENSED STATEMENT OF CONDITION AS AT THE CLOSE OF DECEMBER 31, 1918

#### **RESOURCES**

#### LIABILITIES

Loans and Discounts 1	P139,193,373.32	Capital P 9,210,320.00
U. S. and Philippine Government Bonds	3,778,684.57	Reserve Funds 3,560,104.78
Furniture & Fixtures	202,254.24	Reserve for Taxes, etc 1,862,531.07
Exchange for Future Delivery	4,023,675.45	Dividends Unpaid 646,070.26
Due from Branches	5,002,695.33	Circulation 4,407,359.65
Due from Banks and Bankers	4,136,577.75	Acceptances 10,939,657.44
Cash in Vault and with Treasurer of	•	Exchange Contracts 4,923,675.45
Phil. Islands	43,353,226.91	Commercial Credits 28,766,103.32
Customers' Liability L/C and acceptances	49,107,592.31	Deposits 186,182,257.91

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P248,798,079 88

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Wm. H. ANDERSON
RAMON J. FERNANDEZ

V. CONCEPCION

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MILTON E. SPRINGER

**P**248,798,079.88

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J. ELMER DELANEY Vice-President and Manager

> D. PEKSON Secretary

M. S. CONCEPCION Assistant Secretary CHAS. C. ROBINSON Second Vice-President

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ANTONIO GIMENEZ
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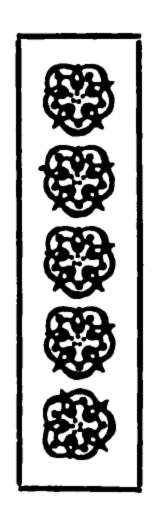
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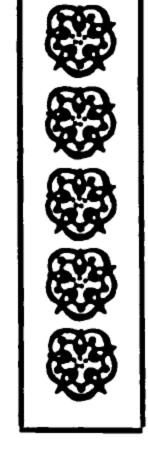
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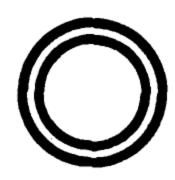
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(ESTABLISHED IN 1900)

Issued every morning except Sundays and Bank Holidays

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## FOREWORD

HIS Anniversary Number of the Manila Daily Bulletin, "The Exponent of Philippine Commerce," published during the twenty-first year of American occupation of the Philippine Islands, appears at a time when not only are the eyes of the western world turning toward the vast productive areas of the Orient but on the eve of important political developments which, it is hoped, will define for all time the relations between the Philippine Government and the United States.

To those in America, who have thought of the Philippines as something completely apart from our national life, it is aimed to give this number a special message. In it the Philippines is presented as it stands today after more than a score of years of American tutelage. The picture that must be painted is that of a country with vast undeveloped resources, but at the same time a country and a people that have expressed themselves as willing and happy to welcome that aid to economic development which comes in the same spirit that has been invariably typified by the democratic institutions that have been implanted in the islands under the Stars and Stripes.

It is desired to convey, as well as one may convey pictorially, an idea of the beauties of Philippine scenery and the monuments of progress that have been erected during American occupation in the form of civic edifices, roads, bridges and manufactories. And at the same time there is an effort to bring to the reader at least a breath of the air of medievalism that still lurks in the old Walled City and in the nave of many an ancient Spanish cathedral and monastery.

While it is manifestly impossible to cover Philippine conditions or opportunities in a single publication, attention is called to the commercial possibilities of the Islands and to the patent advantages presented by its location for the establishment of a strategic base for the development of American business and commerce in the Far East.

The book itself is almost entirely the product, so far as designs, cuts and press work are concerned, of Filipino artists and craftsmen, and the volume is issued as a feature of the present campaign for closer commercial relations between the Philippines and the United States.

The publishers take this opportunity of expressing their gratitude to the following to whom credit goes for the photographs reproduced in this Anniversary Number: The Bureau of Science, the Bureau of Public Works, the Bureau of Agriculture, the Camera Supply Company, and Messrs. Roberts, and D. Denniston.

The half-tone clichés and color plates are the product of the Bureau of Printing, and for their excellence credit goes to Mr. C. E. Doty, head of the photo-engraving department, and to the Filipino craftsmen on his staff.

The issue has been printed upon the presses of E. C. McCullough and Co. of Manila.

The advertising section has been compiled by Special Representative, Fielding J. Stilson, and a greater part of the advertisements were designed by O. F. Wang of the Metropolitan Advertising Agency, Manila.

The Manila Daily Bulletin also wishes to express its thanks to those who have contributed the articles on various phases of Philippine life, industry and development; to officials of the Philippine government who have co-operated most heartily in making this publication a success; and to the advertising public, without whose liberal support this volume could never have been produced.



#### Abaca or Manila Hemp Industry of the Philippines

By N. N. SALEEBY

A BACA is not only the most important export port also the most important export product of the Philippines. For a number of years this fiber comprised more than one-half of the total export trade of the Islands. The received in the state of the product of the

In the commercial world this fiber is known as "manila hemp" or "manila". It is often called "hemp," especially locally by the English-speaking community, but this term is both incorrect and misleading, and its use should be discontinued in favor of the

"use should be discontinued in layor of the Spanish-Flijmo term "abach." History of the industry. The first authentic account of the use of either abach or banana fiber in the Philippines is that given by an Englishman, Dampier, who lived in Mindanao in 1686. This writer describes the "banana textoria", both as an edible and as a fiber-producing plant. One of the companions of Magellan, Antonio Pigaletta,

Fiscal year ending June 30-

prepared a description of the plants of the Philippines, but in this paper no mention is made of abacá. This indicates that both Dampier and Pigafetta citter did not know of the abacá plant or more probably they both confused it with the banana plant, owing to the strong resemblance between the two species.

The fiber was first exported from the Islands about the beginning of the last century but the export did not become important until about 1850. In 1820 a sample of abacid was brought to Salem, Mass., by John White, a lieutenant in the United States Navy. From 1824 to 1827 the fiber began to be used quite extensively in Salem and Boston.

The production of aback for export did not commence until 1818, when 41 tons were exported. Until 1830 the exports ranged from 100 to 500 tons annually, but in 1840 of \$0,000 tons in about ten years. During the ten years from 1840 to 1850, the exports remained practically stationary, amounting to \$5,000 tons in the latter year. The decade to \$5,501 tons in the latter year. The decade to \$5,501 tons in the latter year. The decade to 1870 shows an increase of from 30,388 to 31,426, or about 1,100 tons only. From 1870 to 1870 shows an increase of from 30,388 to 31,426, or about 1,100 tons only. From 1870 ton 1870 ton 1870, the exports increased from 31,420 to 89,448 tons, with an average in 31,420 to 80,448 tons, with an average in adde.

The quantity and value of the exports of abacá from the Philippines since the fiscal year ending June 30, 1900, are as follows:

Value in U. S. currency. All countries.	Percent-	
Quantity. Value.	age of total ex- ports.	value per ton.

,	_	7	7		_	_			_	_	7						_						_				_	_	_	_	_	_	Metric tons.			
1900.																			÷			÷			÷				÷				76,709	\$11,393,883	52.6	\$148.53
1901																																	112,215	14,453,110	54.6	128.80
1902																																	109,969	15.841.316	58.3	144.05
																																	132.242	21.701.575	54.7	164.10
1904																																	131.188	21.794.960	58.8	165.34
1905																																	116.733	22,146,241	59.6	189.72
																																	112,165	19,446,769	59.5	173.38
1907																																	114,701	21.085.081	51.7	183.83
1907																																	114.701	21.085.081	51.7	183.83
																																	115.829	17.311.808	52.7	149.46
1909																																	149.992	15.833.577	51.0	105.56
																																	170.789	17.404.922	43.6	101.91
																																	165,650	16.141.340	40.5	97.44
																																	154.047	16.283.510	32.3	105.70
																																	144.576	23.024.744	43.2	159.25
1914																																	132.873	22.375.106	44.8	16.39
1915		٠.		• •		• •				٠.	٠	٠	• •	٠	•	٠.	•	٠.		•	٠.	•	•	٠.		• •	٠.		•	•			142.010	21.339.100	39.7	150.25
1016			•	• •		• •	• •									٠.	٠	٠.			٠.		•	٠.	٠	• •							137.326	26.692.296	38.1	194.35
1916	٠		٠					٠.	٠								٠				٠.	٠				• •							169,435	46,807,780	48.9	276.25
1917-	٠						٠.	٠.						*		٠.	٠			٠	• •	٠	٠		٠	٠.							109,433	40,807,780	40.9	276.23
					_																															

\*Fiscal year ending December 31 (calendar year.)

During the whole history of the abaca in lustry, the fiber has been identified with the Philippines. This is due to the fact that the introduction of the abaca plant into other tropical. Countries, using the product of the countries of the coun

Distribution. Abacá is distributed throughout the greater part of the Philippine Archipelago. The provinces and islands which are most lavorable for the growth of the nervial fiber is produced are the following: Southern Luzon, comprising the Provinces of Ambos Camarines, Albay, and Sorsogon; Leyte, chiefly the northeastern, western, and southeastern parts; Samar, chiefly the northern and southeastern parts; and Mindanao, comprising the Provinces of Davao, Jolo, Misamia, Surigao, and Agussar. The plant lands of Negros, Cebu. Mindoro, Panay, and Marinduque. The most northern limit of the cultivation of aback is central southern Luzon, comprising the Provinces of Cavite, Lagung, and Batangan, and Batangan, and Batangan,

Climale and soil. The structure of the abaca plant and its habits of growth are such that a large and constant supply of moisture is required. The most important abaca provinces have, as a rule, a heavy and evenly distributed rainfall. The actual amount of rainfall required by the abaca plant is not very large, but it is essential



TYPICAL OF IMPROPER METHODS OF CULTURE

that it be evenly distributed throughout the year. In districts having a long and pronounced dry season, irrespective of the annual amount of rainfall, the cultivation of abacá can not be successfully carried on unless water is available for irrigation.

The aback plant requires a warm climate, and for this reason its successful cultivation can be accomplished only in tropical countries and below an elevation of 1,000 meters (3,280 feet). Cold climates are detrimental to the plant, both in regard to the extent of the plant both in regard to the extent of the plant to the plant to the plant to the plant to affect the plant unfavorably, probably because it causes excessive and rapid evaporation of moisture both from the leaves and the soil, especially during the driest period of the year.

The abacá plant with its heavy broad leaves is very often seriously injured by strong winds. It is, therefore, always desirable to select localities which are naturally protected from such winds, particularly in all provinces lying within the typhono bett. If natural barriers are not available, windbreaks must be planted along the exposed side or sides and also at intervals among the plants.

Next in importance to favorable climatic conditions is the selection of a suitable soil. The suitability of any particular type of soil of necessity depends, on the one hand, on the climatic conditions, and on the other, location where the land is low and where a heavy rainfall occurs, a certain soil, would become oversaturated, while the same type of soil, if the land were higher and the rainfall less abundant, might be sufficiently well

Throughout the important aback districts the plantations are situated on the lower slopes of volcances or other mountains. The soils in such locations are, as a rule, deep, fertile, and well drained. Besides being well drained, the soil should be of lasting fertility, as aback is grown on the same land for a period of ten to fitteen years without replanting, rotation, or fertilization. This exposes the soil to a long drain

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on its resources. Besides having lasting fertility, the soil should also be of medium Consistency so as to allow the plant to benefit by the constant supply of moisture without the soil becoming oversaturated.

Description of the plant. The abacá is perennial plant 5 to 10 meters (16 to 3 perennial plant 3 to 10 meters (1b to 35 feet) high. When mature it consists of a group, or cluster, of from 12 to 30 or more stalks of different stages of development. The stalk is cylindrical, 2-½ to 6 meters (8 to 20 feet) long, and is formed by the overlapping of the leaf sheaths. The sheaths lapping of the leat sheaths. The successions grow from the fleshy, central core, which is the real stalk, until the sheath formation is completed, when the flower bud developes and forms the flowering spike. The flowers are the flower than the flower than the flower than the flower than the flowers. are borne in clusters subtended by a large membranous bract. The first few bracts which subtend the real flowers are larger and more conspicuous than the rest which subtend the false flowers

The abacá plant closely resembles the banana. To the inexperienced eye, it is rather difficult to distinguish the one from the other. The abacá is ordinarily smaller than the banana and its stalks are, as a rule, more slender than those of the latter. abacá leaf is darker green, narrower, and more tanering than that of the banana. The more tapering than that of the banana. petiole (leaf stalk) of the abacá leaf is of a light-green color, while that of the banana

light-green color, while that to the light-green color, while that to the grayth, its grayth, its grayth, and the grayth green can a number of overlapping sheaths. This core is a continuation of the flesby part of the rootstock, and, as it grows, sheaths are formed on its atdee, chiefly at the base. When the green can be considered to the state of the green color of the green color of the green color of the green can be green color of the green c inishes in diameter as it rises in the middle of the stalk. Its diameter at the base of the stalk varies from 15 to 35 centimeters (6 to 14 inches), and at the top it rarely ex-

(6 to 14 incnes), and at the top it rarely exceeds 5 centimeters (2 inches).

The stalk consists of 12 to 25 sheaths, depending on the variety and the extent of growth. The middle sheaths alone are



ABACA PLANTS BETWEEN SIX AND TWELVE MONTHS OLD, GROWN BY PROPER METHODS OF CULTURE



THE SAME FIELD AS SHOWN IN PRECEDING PICTURE, SIX MONTHS LATER

exactly the same length as the stalk. The exterior sheaths rise from the base of the core but do not extend to the top of the stalk. and the interior ones, which extend to the top of the stalk, do not rise from the base but at variable intervals above it.

Fiber extraction. The abacá plant when mature consists of a group of 12 to 30 stalks. These stalks are in all stages of development, These stalks are in all stages of development, but usually two to four can be harvested at the same time. The stalk is mature at the time of the appearance of the blosom, or shortly before. As a rule no cutting should commence before the plant is 2 to 3 years old. After the first harvest subsequent cuttingscan be made every four or six months.

The process of fiber extraction consists. of two distinct operations: First, the removal of the ribbon-like fibrous strips from the sheath; and, second, the separation of the individual fibers by pulling these strips un-

The laborer, sitting on the ground with a stalk in front of him, inserts a small, sharp piece of bone or bamboo into the sheath, separates the fibrous strip and pulls it off separates the norous strip and pulls it of in two to four ribbons, varying from 5 to 8 centimeters (2 to 3.14 inches) in width and as long as the sheath itself. When these ribbons have been separated, the remainder of the sheath is removed and thrown away as waste. Each consecutive sheath is thus worked until the central core of the stalk is reached.

When a sufficient quantity of these fiber strips, or ribbons, has been collected, they are tied in bundles and carried to the stripping apparatus, which consists of a log set in a horizontal position ½ to 1 metter (1-½ to 3 feet) from the ground, on top of which is fastened a level block of smooth, hard wood or bamboo. Over this block is placed a knife about 30 centimeters (12 inches) long with a handle 40 centimeters (16 inches) long. Every strip is passed under the knife twice, the second time to pull the buttend which the operator holds in his grasp during the first pull. This process of drawing under the knife removes all the pulp, leaving in the hands of the operator a bunch of clean, white fiber. As soon as the strips are cleaned, the fiber is hung over a bamboo pole to dry.

Practically all of the fiber produced in the Philippine Islands is extracted with this simple apparatus. The strength and color

of the fiber-two most important qualities of the fiber—two most important qualities— are determined largely by the manner in which it is cleaned. Three factors in the process affect the quality of the product—the con-dition of the knife blade, the degree of pres-sure with which the knife is held upon the block, and the manner of drying the fiber. With a servated knife loosely fastened the With a serrated knile loosely lastened the fibers are only partially separated and only a protion of the pulp is removed, the work is easy, the yield large, but the fiber is inferior in quality. With a knile having a smooth edged blade and held firmly on the block, the work of extraction is somewhat more difficult and the waste greater, but a very superior fiber is obtained. Prompt and thorough drying will give the fiber its white and lustrous color.



BACA PLANTS ON AN UP-TO-DATE PLANTATION IN AVAO, ILLUSTRATING EXTENT OF GROWTH AS RESULT OF APPLICATION OF MODERN METHODS OF CULTURE





A MODERN HEMP PLANTATION AT THE PRODUCING STAGE

Quality and grades. The quality of abaca is determined by four characteristics, namely, strength, color, cleaning, and length.

ly, strength, cotor, cleaning, and length.

The tensile strength of aback is more of a basic characteristic, and its possession to a proper grading.

The tensile which does not proper grading, Any fiber which does not possess an average normal strength is disqualified and excluded from the list of standard grades proper, irrespective of its color, cleaning, or length. This characteristic is not a determining factor in the sense that it is not commonly measured or compared between two adjacent grades. As a matter of fact, the tensile strength of aback does not perceptibly vary from one grade to ansone group of grades and another.

One group or graces and another.

Color and cleaning are probably the most important outward characteristics by which important outward characteristics by which important outward characteristics by which within the same group of grades which embrace fiber of uniform cleaning color is practically the only determining factor. Owing to the peculiar construction of the abaciplant, and also to the diversified method of cleaning, and also to the diversified method of cleaning and the diversified method of cleaning and also several grades within the same group according to the extent of cleaning, and also several grades within the same group according to color. In other words cleaning is the factor which determines the group of grades within which a certain which determines the grade within which a certain which determines the grade within ach group.

The length of the fiber is neither a characteristic of each grade nor of each group of grades. It is entirely governed by the extent of the growth of the plant and by the position of the leaf-sheaths of the stalk from grades of each group, are made up of short fiber. It is only in rare instances where a fiber of certain grade of the cordage standard is disqualified on account of insufficient length. As a matter of fact, insufficient length, as a matter of act, insufficient harvesting immature stalks or harvesting therefore the stalks or harvesting dwarfed and worthless plants.

The grading of abaca for export is performed under Government supervision and inspection, the number of grades and the designation thereof being prescribed by Government regulations. The number and designation of the standard grades are as follows:

- 4			s	ю	12	a	a	re	ı	(	,1	a	а	e	3	J	0	,	-	$a_l$	ζ	и	orasa	noer
es	L			01																			ET	ne of
A			-																				Taga	one
В																							Tagal	two
c																							Tagal	three
D										-								-					Tagal	four
Е		•							•		-		•						•	-		•	Tagal	five

The fiber in the above grade is never, or should never be, under 6 feet in length, and the color range from light cohe in the grade "EE" to white and ustrous in the grade "AA." These grades are exported practically enhanced as a response of the practically the grade of the practical color of the grade state of the grade state of the grade of

Standard grades for cordage.
 In order to explain as briefly as possible

the nature of the fiber in the following grades, they are grouped according to cleaning.

Man Son 1 71

etter Designation.	alion.		Name of Grades.		Group.
			Extra prime.	-	Grades embracing fiber of excellent.
			Prime.		Cleaning, which can be strictly termed
		:	Superior current.		oas pure fiber, althoughit has a tendency
			Good current.		f being sometimes slightly strippy
			. Midway.		in the grades "E, "S-2" and "S-3.
			Streaky No. 1.		
			Streaky No. 2.		
			Streaky No. 3.		
		:	Current.	=	Grades embracing fiber of good cleaning
			Seconds.		which is slightly strippy, but which
			Brown.		for all practical purposes, can be used
			Good fairs	=	as pure fiber.
			Fair		and which is distinctly stringy, and
			Medium:		consequently of a harsh texture and
				1	a "bold" size.
Coarse			Coarse.	≥	Grades made up of fiber of coarse clean
			Coarse brown.	;	ing, or coarse strips.
			Daet coarse.	>	Grades made up of woody fiber (D-1 and
			brown.		DM), waste fiber (O, OO, T) or dam
					aged fiber (Y).
		-	ng.		
			Tow.		
Damaged			Damaged		

The grades marked with (\*) are almost invariably made up of short fiber produced from the outer leaf-sheaths of the abacd stalk.

Yield and value. From 400 to 500 abaca plants are usually planted to the acre. Each plant consists of several stalks, three of five of which can be harvested annually. The annual yield of fiber per acre varies consi-



SECOND PROCESS OF EXTRACTION. PULLING THE FIBER RIBBONS UNDER THE KNIFE

UNIVERSITY OF CALIFORNIA



FIRST PROCESS OF FIBER EXTRACTION. SEPARATION
OF THE LAYERS OF THE SHEATHS



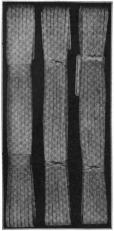
DRYING ABACA FIBER IMMEDIATELY AFTER EXTRACTION

derably, but under normal conditions and by proper treatment an average of one-half ton of dry fiber can be obtained. The quality of the fiber also varies considerably depending on the knife used, the amount of care taken in cleaning the fiber, and the care in handling it prior to and after extraction. The average quality or quantities produced, however, should be those for which the type of fiber in the particular district concerned is best suited and for which there is at the time the strongest demand and best prices. These conditions vary widely, as a result of the differing requirements of the consuming the differing requirements or the ignorance markets, and also because of the ignorance of the bulk of producers of the qualities most indicate the different time. This last fact is mostly responsible for periodical oversupplies in certain grades and a corresponding shortage in others. But taking, as a basis of calculation, the average production of a plantation of the grade "F" current, valued at an average price of P400 (\$200) per ton during normal years, the average annual gross income from one acre of land would be

gross income from one acre of land would be about #200 (Stringing to manuity one acre of about #200 (Stringing to manuity one acre The cost of bringing to manuity one acre 1700 (St.). The annual cost of subsequent cultivation is estimated at £10 to F12 (St. 56 bp) era cer. The cost of harvest-P12 (St. 56 bp) era cer. The cost of harvest-product ranges from F175 to F200 (St. 50 to S100) per long or F87 to F100 (St. 55 to S10) per long or F87 to F100 (St. 55 to S10) per acre. During normal times the per subsequence of the strength of the

Uses of abacá. The chief uses of abacá are in the manufacture of marine cordage of various sizes and grades, oil drilling rope binder twine, trawl twine, tarred lathe, and tagal braid and textiles.

The manufacture of marine cordage takes the bulk of abaca fiber, perhaps not less than 75 percent of the total production. The grades of the fiber used for this purpose depend on the grade of the rope made, and also on the country where the rope is manufactured. The United States uses the grades C, D, E, F, S1, S2, I, and the softer type of J, hence these, with the exception of the last grade, are generally designated as U.S. grades. Of these grades, however, the bulk of demand



THREE QUALITIES OF TAGAL BRAID MANUFACTURED IN JAPAN FROM MANUA HEMP

is for the grades E, F, I, and J, more particu-larly the grades F and I. Great Britain uses the grades S, G, H, J, K, L, and M, but the grades S, G, H, J, K, L, and M, but These grades, therefore, are commonly called U. K, grades. Of the cordage grades pur-chased by Japan S2 S3, J, and L form the chief ones; Australasia buys a limited quan-tity of the grades D, E, F, I, J, K, and I, while British India buys small quantities of J, K, and L. In recent years the United States has been using about 50%, Great Britain about 33%, and all other countries

Britain about 33%, and all other countries about 17% of the total production of abacá. In the manufacture of oil-drilling rope only the higher grades are used, perhaps little or none under "good current."

The use of abacá in binder twine has re-

cently been declining due, first, to the scarci-ty of the middle and higher grades of abacá and their consequent rise in price; and, second, to the increase in the production of henequen and other sisal fibers, which are more uniform in quality than abaca, and which, though not as strong and durable as the latter, yet are strong enough for binder twine. Probably less than 10 per cent of the total supply of abacá is now being used for binder twine.

Trawl twine is made from abacá of the Tawl twine is made from abaca of the grades midway or above. For this purpose the fine and soft fiber is particularly required, of the well cleaned (soft) aback, and of the well cleaned (soft) aback, and or opes are used for hauling lumber at the saw mills, and for other similar purposes. The manufacture of tagal (hat) braid is of a comparatively recent, origin. As previously mentioned, only the highest grades of abaca are used for this purpose and Ja-

pan is practically the only buyer of such Some European countries buy these high grades, knotted and twisted into hanks,



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#### Philippine Public Schools

BY W. W. MARQUARDT, DIRECTOR OF EDUCATION

CINCE this article is to be brought to the attention of Americans in the United outset two points which are matters of common knowledge in the Philippines but concerning which very erroneous impressions exist in the minds of those in America who are not thor-oughly conversant with Philippine affairs. Due perhaps to the fact that the present system of public instruction in the Philippines was instituted by American teachers and super-intendents, and that this system is still maintained with their assistance, the impression that the United States Government extends financial support to the Philippine public schools prevails in the minds of many Americans. As a matter of fact every cent spent cans. As a matter of fact every cent spent has been furnished wholly from Philippine revenues. The schools have been supported entirely by appropriations of the Insular government, by municipal taxation, and by generous voluntary contributions in the form of cash donations, free labor for the con-struction of buildings, and gift of buildings and land

The second point about which there is a wrong impression is the language of instruction in the public schools. Few Americans who have not come in intimate contact with who have not come in internal contact with schools of the Philippine Islands English is schools of the Philippine Islands English is the language of instruction. The reasons why all instruction is in English are obvious. The people of the Philippine speak many for economic progress and political development. The poverty of the dialects requires the teaching of some other tongue as the commitme of American occupation Spanish was neither spoken nor written by more than ten per cent of the entire population, so that the adoption of English as the language for than the adoption of Spanish was not the support of the progression of the spanish. Moreover,



A CHAMPIONSHIP GAME OF INDOOR BASEBALL, WHICH IS A FEATURE OF THE PHYSICAL TRAINING GIVEN GIRLS IN THE PUBLIC SCHOOLS

English being the language of democracy is fast becoming the commercial language of the world, and particularly the commercial language of the Far East, a field where Spanish is declining in importance as a business asset.

The building up of an English-speaking Filipino teaching staff is a districtive achievement reflecting credit on Filipinos as well as on Americans. A large percentage of Filipino teachers have had little or no actual training in regular normal schools or in other special schools for the preparation of teachers are selected from all over the Islands for attendance at the Teachers' avacation Assembly in Manila. Atthe assembly, which is

held in the Philippine Normal School, emphasis is placed on primary and on intermediate methods, on physical training, and on the latest developments in industrial work. When the teachers who attend the assembly return to their provinces, they in turn become instructors in the division normal institutes, in which nearly all of the teachers receive at least four weeks normal training each year. This training has been of the greatest importance in the improvement of methods of instruction. The institute training is augmented by participation in professional reading courses, by close contact with supervising teachers, by visiting days, by the observance of the work of model teachers, and by teachers' meeting of various kinds.

The facilities for training teachers are constantly better. The Philippine Normal School has sent forth more graduates during the last three years than during all of the other fifteen years of its existence. The Philippine School of Arts and Trades and the Central Luzon Agricultural School are turning out teachers of wordworking and teachers of agriculture in larger numbers. Most of the teachers sent to the Department of Mindanao and Sulu are graduates of the Central Luzon Agricultural School. The sinding of five hundred Filipino teachers is one of the most significant features in the problem of unification or nationalization of the many diverse elements of the population.

The number of Filipino supervising teachers increased from 200 in 1915 to 294 in 1918, while the number of American supervising teachers decreased from 120 in 1915 to 41 in 1918. The number of Filipino high-school teachers increased from 61 in 1915 to 170 in 1918. In 1915 there were no Filipino superintendents and there was no Filipino in the directorate of the Bureau of Education in the directorate of the Bureau of Education.



THIS SEWING CLASS IS INDICATIVE OF THE PRACTICAL NATURE OF THE VOCATIONAL TRAINING GIVEN GIRLS IN THI

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THE ATHLETIC FIELD AT TEACHERS' CAMP, BAGUIO, WHERE TEACHERS ASSEMBLE EACH YEAR FOR CONFERENCES AND RECREATION

interested in the establishment of farm schools and Bureau of Education officials will not be satisfied until every province in the Islands has at least one large school in which farming is taught.

The following extract from an article prepared by the Director of Education for the statistical bulletin of the United States Bureau of Commerce and Industry indicates the importance of the place occupied in the course of study by industrial instruction:

#### "INDUSTRIAL INSTRUCTION

"Industrial instruction occupies an important place in the course of study. About 17 per cent of the total time in primary grades and about 18 per cent of the total time in the general intermediate course is devoted to mediate courses and in special types of primary schools about half of the time is devoted to industrial work. The following gives an idea of the value of the commercial output 188, Embrodieries, \$12,500; lace \$9,000; crochet, \$4,500; sewing \$28,000; cocking \$3,500; baskery, \$33,000; hats, \$1,500; hats, \$1,500; baskery, \$3,500; ba

Today the second assistant director of the Bureau of Education is a Filipino and six provinces are in charge of Filipino superintendents.

All public schools in the Philippine Islands are included in a centralized system under the administration of the Director of Education, who is directly responsible to the Secretary of Public Instruction. In the 4,706 public schools in July, 1918, were \$70,069 public schools in July, 1918, were \$70,069 in high schools; 13,71 grades; 10,221 pupils in high schools; 13,71 lipno teachers; and 356 American teachers.

Most Philippine school activities are classified either as academic, as industrial, as physical-training, or as social activities. No one of these branches is neglected or over-emphasized at the expense of others.

The elementary and the secondary courses are patterned largely after those in America. Adaptations to local conditions have led to the development of special features which differentiate the work in Philippine schools from the work in American schools.

As agriculture has been, is now, and always will be the basis of Philippine prosperity, instruction in agriculture receives Iull attention. In 1918, 4,023 school gardens and 103,780 home gardens were planted by pupils under the supervision of teachers. There clubs and 1,200, in pip-raising clubs. Most of these pupils kept record books showing the cost of operation of and the net profits from their home enterprises. In this way, lessoon traught, and through the contral pupils and the contral pupils and the profits from their home enterprises. In this way, lessoon traught, and though the profits of th

Financial support and trained instructors are the primary needs of agricultural education. The Central Luzon Agricultural School at Muños and the College of Agricultural at Loss Baños are now turning out trained farmer and the properties of the College of Agricultural at Loss Baños are now turning out trained farmer and the College of Agricultural the Bureau of Education to establish during the school year 1918: I three agricultural schools with farms of 3,000, 500, and 575 acres, respectively. In addition to this appropriate of the farm school sired year of the farm school sired year of the farm school sired yes tablished. These allotments made 1918 a red-letter year in the history of agricultural instruction in Philippine public schools, and this is only the school of the farm school sired year of the proporties appropriations for the get for 1919 or the school of the farm school sired year of the proporties appropriations for the get for 1919 reviews proporties appropriation for the farm of three more provincial agricultural schools are



AN EMBROIDERY CLASS IN A PUBLIC SCHOOL SHOWING HOW VOCATIONAL TRAINING RECOMES AN IMPORTANT PART OF THE INSTRUCTION GIVEN GIRLS ATTENDING THE PUBLIC SCHOOLS



BOYS ATTENDING A VOCATIONAL SCHOOL BRECTING A CONCRETE BUILDING

products of loom weaving, \$3,500; bamboorattan furniture \$3,000. A large number of other articles were made in small quantities.

other articles were made in small quantities.

"The value of the gross output of trade schools during the last three years follows: For 1915, \$61,418.81; for 1916, \$79,142.04; for 1917, \$106,485.12. These figures include only the cost of material and do not give a definite idea of the total value of work done

by pupils.

"Due to war conditions, the total value of embroideries exported from the Philippines increased from \$162,456 in 1914 to \$1.561.-214.50 for the fiscal year July 1, 1916, to June 30, 1917. A part of this increase was undoubtedly made possible by instruction given in the public schools.
"War conditions have not been favorable

for the production of all commercial articles in the public schools, however. The great increase in transpacific freight rates has made it unprofitable to export articles the value of which is not relatively great as compared with weight and with bulk. Excessive cost of transportation has thus made it necessary to abandon the making of larger and more bulky articles.

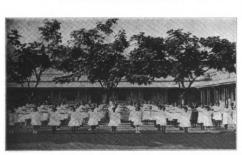
"The Bureau of Education through traveling industrial teachers has fostered house-



SCHOOL-MADE BASKETS



A CLASS IN A PUBLIC SCHOOL. THE PHILIPPINE GOVERNMENT SUPPORTS 5,000 SCHOOLS WITH A TEACHING FORCE OF 12,000, PROVIDING INSTRUCTION FOR 600,000 PUPILS



PRIMARY SCHOOL PUPILS RECEIVE DAILY PHYSICAL TRAINING IN THE FORM OF GROUP GAMES, FOLK DANCES AND

hold centers, the members of which engaged in the making of embroidery, lace, and other articles of handicraft. The Bureau of Education gave up the supervision of these centers as soon as they were developed to a point where they could deal directly with business houses.

"During the last year the value of school production of articles of handicraft was \$86,-270.50 and the value of production of household centers was \$11,782. Articles to the sales department of the Bureau of Education, and local sales amounted to \$5.852.50."

During 1918 war activities found an important place in school work. During the fourth liberty-loan drive employees of the Bureau of Education bought almost as many liberty bonds as did the employees of all other bureaus of the Government put to-gether. Forty American and eighty Filipino teachers applied for commissions in the Phil-



A SCHOOL EXHIBIT OF VEGETABLES FROM ONE OF THE A 000 PUBLIC SCHOOL GARDENS IN THE PHILIPPING ISLANDS WHERE 100,000 PUPILS RECEIVE DAILY INSTRUCTION IN FOOD PRODUCTION AND FOOD CON-SERVATION





LIBRARY, PHILIPPINE SCHOOL OF ARTS AND TRADES, MANILA. THE PUBLIC SCHOOLS OF THE PHILIPPINES OWN 1,230 SCHOOL LIBRARIES ALL OF WHICH ARE AVAILABLE FOR THE USE OF THE PUBLIC

In 1917 military training was made compulsory for secondary students. Uniforms were adopted, but were not required. Instruction in military training is given printically the printing of the printing printing in the printing of the printing of the bearing; military training will make them more valuable to their native land both in time of peace and in time of war.

For a number of years, physical training has played a very important part in the school curriculum. Group games and calispunds, and seed that the school curriculum and calispunds, and specialized competitive athetics have been engaged in by chosen athletes. The effect of physical training has not been confined simply to the improvement of health acquiring of skill and desterity. The lessons of fair play, the effect of team work, the development of leadership, and the democracy in the minds of the pupils through their participation in a stabletics.

Before 1916 specialized secondary courses (normal, commercial, trade, and agricultural) were given only in Insular schools. In 1917

ippine National Guard, and hundreds of students offered their services as privates. Red Crose Day at Teacher? Camp on May 7, 1918, netted a total of \$2,500 for the Red Crose Leacher in the Philippine Islands joined the Senior Red Cross and 215,154 pupils joined the Junior Red Cross. More than \$100,000 Cross work; many thousands of garments were made by schooljeris for refugee children in France and in Belgium; and thousands of ria. During the Christmass Red Cross membership campaign, each division superintendent acted as secretary of the provincial campaign committee, and in each municipacity of secretary of the local committee. Thus the full force of the public-school system was thrown solidly behind the Christ-factory.



A SECTION OF THE FINAL CORN EXHIBIT OF AN EXTENSIVE CAMPAIGN CARRIED ON BY THE PUBLIC SCHOOLS OF THE PHILIPPINES TO INCREASE THE PRODUCTION VE CORN AND EXTEND ITS USE AS A HUMAN FOOD



PARADE OF ATHLETES AT THE ANNUAL MANILA CARNIVAL ATHLETIC MEET WHERE WINNING TEAMS OF ORGANIZED ATHLETIC ASSOCIATIONS OF THE PUBLIC SCHOOLS OF THE PRILIPPINES COMPETE FOR INSULAR CHAMPIONSHIPS



SCHOOL BOYS CHANGING THE TEETH IN A CIRCULAR SAW AT A SAWMILL OWNED AND OPERATED BY THE STUDENTS ATTENDING THE CENTRAL LUZON AGRICULTURAL SCHOOL, WHICH IS ONE OF THE TWENTY-SEVEN VOCATIONAL SCHOOLS OF THE PHILIPPINES WITH PRACTICAL AGRICULTURAL COURSES



ONE OF THE 4,000 SCHOOL GARDENS CULTIVATED BY PUPILS ENROLLED IN THE PUBLIC SCHOOL

normal courses were offered in six provincial capitals. In 1918 the commercial course was established in one provincial capitals, in agricultural courses, in three provincial tapitals, schools; and the domestic-science course, in ten provincial high schools; and the domestic-science course, in ten provincial high schools are proposed to the course of the course, the course of t

During 1918 the governments of Guam, of the Straits Settlements, and of Penang started employing Flipino teachers to give instruction in industrial work and in English instruction in industrial work and in English and several Japanese and Korean commissions visited the Philippine Islands during 1917-18 to inspect the school system. The highing to Flipino teachers in foreign lands and the visits of these commissions indicate system holds in the Far East.

The two most significant factors in connection with the attendance in the public schools are the increasing number of pupils in the higher courses and the constantly increasing proportion of girls to boys. For several years the revenues of the Bureau were practically at a standstill. During this time, the number of pupils enrolled in the primary schools was maintained at approximately the same figure, but the average daily attendance increased steadily. During the past five years, however, the attendance at intermediate schools has increased about twelve per cent each year and the attendance at secondary schools has increased from twenty to twenty-five per cent each year. This increase in the higher grades without any diminution in lower grades was made possible largely by the payment of tuition fees in intermediate schools. Now, however, the improved financial condition of the country makes it possible to increase the number of primary pupils to an unlimited extent and at the same time makes it possible to maintain all intermediate and all secondary schools at Government expense.

The continually increasing proportion of source of intense satisfaction. During the Spanish regime co-education was not known in the Philippines and the education of girls was even more neglected than that of the proposed of the proposed of the satisfaction of the satisfaction of the satisfaction of the satisfaction was somewhat revolutionary and it was some time before it was generally accepted. Even after its evident of the satisfaction was somewhat revolutionary and it was some time before it was generally accepted. Even after its evident of the satisfaction was somewhat revolutionary and it was some time before it was generally accepted. Even after its evident of the satisfaction was somewhat revolutionary and it was some time before it was generally accepted. Even after its evident of the satisfaction was somewhat revolutionary and it was some time before evidence of the satisfaction was somewhat the satisfaction was somewhat the satisfaction was somewhat the satisfaction was somewhat the satisfaction of the satisfaction was somewhat the satisfaction was somewhat the satisfaction was somewhat the satisfaction of the satisfaction was somewhat revolutionary and the satisfaction was somewhat revolution was so

grades. Statistics show, however, that during the past five years the attendance of boys in intermediate schools increased \$2 per cent while the attendance of girls increased 222 per cent. In the high schools the attendance of boys increased 250 per cent with the attendance of boys increased 250 per cent. It is believed that the introduction of secondary domestic-science courses will result in a similar increase in the attendance of girls in the high schools. One of the most apparent results of the school training of girls of the creasing number of women in the employment of the government and in the employment of business firms, the latest development along this line being the employment of women acconductors on ombibuses in

Filipino pride and Filipino confidence in the public-school system resulted in the expenditure of an additional \$500,000 in 1917 for further extension of work among the pagars and among the Mohammedans who the pagars and among the Mohammedans who the Islands. The budget for 1919 increased the appropriations for Philippine public schools by \$1,200,000. On December 5,



CLASS IN SURVEYING. ONE OF THE PUBLIC SCHOOL VOCATIONAL COURSES



NE OF THE 104,000 HOME GARDENS OF PUPILS ATTENDING THE PUBLIC SCHOOLS OF THE PHILIPPINE ISLANDS

1918, the Philippine Legislature voted \$15,000,000 in addition to the regular appropriations to be used in placing free elementary schools within the reach of every child of school age in the Philippine Islands. The expenditure of these funds covers the next five years and is distributed so that by the end of 1923 there will be teachers, buildings, books, and equipment enough to give for all children of school age in the Islands an elementary education.

No expression of the wishes of the Filipino people, who are solidly behind this measure, could show as high confidence in the schools established under American guidance and maintained by Philippine resources as the passage of this far-reaching measure which will not only double the number of pupils in the schools but will increase the salaries of municipal teachers at least 30 per cent. This action dispels the many doubts expressed on many occasions as to the continuance of the American system of education after the ideal of Philippine independence has been achieved.

The system of education established in the Philippine Islands by Americans is destined to remain and to exert its influence thruout the Far East. The Filipino people can be relied on to continue, with the help of American teachers, the most important work that the United States has undertaken in the Philippine Islands-a work unique in in the l'mippine islands—a work unique in conception, successful beyond expectation, and influential in the development of the Far East—a work that owes its past, its present, and its future to the cooperation of Americans and Filipinos.



A SCHOOL GIRL LEARNING TO SET A TABLE FOR THE FAMILY MEAL WHICH IS A PART OF THE PRACTICAL INSTRUCTION GIVEN GIRLS IN THE PUBLIC SCHOOLS OF THE PHILIPPINES



THE CHAMBER OF COMMERCE OF THE PHILIPPINE ISLANDS OFFICERS AND BOARD OF DIRECTORS 1919

(From left to right) Vicente Arias, Hon. Gregorio Nieva, Manuel Cuyugan, Macario Lim Manapat, Vicente P. Genato, Vice President, Vicente Madrigal, President, Leon Ancheta, Secretary, Catalino Lavadia, Rafael Roces, Mauricio Cruz, Angel Ansaldo Digitized by Google

#### The Development of the Sugar Industry

By C. J. H. PENNING



HARROWING (OLD METHOD)

The sugar cane and the industry to manufacture sugar from cane were brought to the Philippines by Chinese, as different names of implements and processes used in the manufacture of sugar are of decidedly Chinese

origin. When Magelian discovered the islands when Magelian discovered the islands in 152 he had a small super industry. The state of the first sta

The real importance of the Philippines as a sugar producing country dates from 1849 when the Spanish governor general put the island of Negros under the jurisdiction of the clerical order of the Recolectos.

This order encouraged the sugar industry and another encouragement was given by the Crimean war, which caused the price of sugar to soar and made the cultivation of

sugar cane and manufacture of sugar for export profitable.

Notwithstanding the bad roads and means of communication, the incompetence of the planters, the lack of capital and the very primitive mills and factory equipment, the su gar industry grew in importance and reached in the last years of the Spanish rule a maxi-

mum production in 1893, with 216.686 tons. Through a financial crisis and later because of revolutions and riots the production decreased in 1901 to 52.274 tons, but increased

again under the beneficial rule of the United In 1910 the production was again 116.346 and has since increased gradually, reaching

383.848 tons in 1917. The following are the crop totals for 1917: Area cultivated hectares 185,931
Crude sugar kilos 362,338,084
Panocha do 23,460,746

Basi do	7,016,84
Average price in Municipal Markets:	
Crude sugar, per kilo	P0.09
Panocha, per kilo	0.10
Molasses, per liter	0.08
Basi, per liter	0.08
Total values:	
Crude sugar	P35,525.04
Panocha	2.414.64
Molasses	162.01
Basi	602,99
Crude sugar	P0.09
Panocha, per kilo	0.10
Molasses, per liter	0.08
In above table "crude sugar"	' include

sugar in bayones, in pilones, and in bulk. Panochas are small cakes of unrefined

sugar. Basi is a beverage produced from fresh canejuice.

The greatest difficulty to a quick expansion of the sugar industry has been the poverty of the planters and their dependence on the money lenders, and until American



rule, the lack of roads to convey their product to shipping points.

The small rural factories are all badly installed and very uneconomical, losing great quantities of sugar through bad ex great quantities of sugar through bad ex-traction and the highly primitive juice treat-ment in open pans and earthenware pots. The bulk of the sugar in the Philippines is still made into so-called "muscovado."

The cane is crushed in small cattle- or steammills and a great amount of sugar remains in the milled cane (begasse), which is burned to boil the juice in a series of open cast-iron pots, arranged in rows on brickwork. A high extraction would in many cases make the bagasse unsuitable for firing under

The flames pass also through a small boiler to generate the steam for the engine driving

The juice runs into the pan furthest away from the fire and is ladled over from one pan to the other, until it arrives in a pan right over the fires.

Here the juice boils hard and most of the water is evaporated. When the boiling is sufficiently concentra

ed the contents of the last pan, are quickly ladled into a low wooden box and stirred until the heavy liquid crystalizes, as it cools On the way in the pans the juice is treated with milk of lime and the impurities are skim-

med off and in some cases filtered and the clean juice returned into the pans

This sugar is put in mat bags called "bayo-nes," and classed in different grades as follows:

No. 1 polarizing 87° or higher No. 2 polarizing 85° to 86.9° No. 3 polarizing 82° to 84.9° No. 4 polarizing 88° to 81.9° No. 5 polarizing 76° to 79.9°

No. 6 or "corriente" are all sugars below

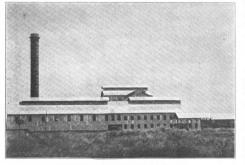
In other cases the concentrated juice is ladled into earthenware jars, called "pilones," conical in shape and containing about 125 lbs. of sugar when crystalized.

The molasses drains away from the crystals through a hole in the bottom, which is covered with begasse when the pilon is filled. Pilon sugar is classified in three qualities.

The first is from the top and contains little molasses, the second is from the middle, whilst the third consists mostly of molasses.

whilst the third consists mostly of molasses.

The pilon sugar is roughly refined. The
top of the pilon is clayed first and thereby
washed. The best part of the washed pilon
sugar is then remelted, treated with white of eggs and recrystallized. A third way to prepare sugar is to let the syrup crystalize in half shells of coconuts.



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PLANTING SUGAR CANE

The resulting lumps of sugar are called "panochas" and are sold in the native markets. The weight is from 1 to 2 pounds. Nearly one-fifth of the sugar for local consumption is sold in this form.

tract of land on the island of Mindoro former-ly belonging to the friars and the first large sugar mill was erected there in 1910, the company cultivating its own cane.

It proved difficult to cultivate such great stretches of land under administration and gradually hacenderos where encouraged to from the company and to cultivate cane, which was bought by the company under agreement with the planters.

These planters generally brought their own laborers with them from Luzon, Negros and Panay, Cebu.

This first mill which is capable of crush-

ing 800 tons of cane per day was followed by on a large track of land formerly belonging to the clergy by an American corporation and situated near Calamba.

This mill crushed the first crop in 1912. having a great amount of cane under own cultivation besides milling great quantities of cane from individual planters.



TRANSPORTING CAME BY GASOLINE POWER

This mill has extended considerably and is at present the largest on the island and capable of crushing 1,800 tons in 24 hours.

The next large sugar mill to be erected was the central at San Carlos. This factory was a central proper, having no land, but crushing cane under an agree-ment between the mill owners and the plant-

This factory, which, for the Philippines, was an experiment, proved highly successful from the point of view of the planters as well as of the millowners and opened the eyes of planters and of investors to the great ad-

vantages of such an arrangement.

The planters of San Carlos found themselves in a few years not only out of debt but men of substance.

This example made the planters in other districts look out for capitalists willing to put up a central under an agreement like San Carlos.

This is shortly as follows: The planters bind themselves to cultivate a certain acreage of their farms yearly with cane and to deliver this on the railway wagons supplied by the millowners.

The millowner undertakes to transport this cane to the mill over tramlines supplied and operated by him, for which a right of way is granted to him over the farms, and to crush the cane, guaranteeing a minimum extraction.

The sugar manufactured from the cane and the resulting molasses are divided between the millowner and planters, according to the agreement made, but usually on a 50 50 basis



LUZON SUGAR CANE EIGHT MONTHS OLD

It is needless to say that these processes are next to medieval and, except for India and China, the Philippines is the only important sugar-producing country where they have survived.

American occupation did not improve the position of the planters during its early years, especially as the people distrusted new ways and were still dependent on their money lend-

ers for financial assistance.
In 1902 the U. S. government made a reduction of duty of 25 per cent on all sugar from the Philippines, imported into the States.

This however did not improve the situa-tion very much as "muscovado" sugar is difficult to refine and therefore most of the Philippine sugar was still consumed by China. A greater help was the Payne-Aldrich bill of 1909 providing free entry for 300,000 tons of Philippine sugar annually into the United States.

The Underwood Bill has since admitted all sugars produced in the Philippines free of duty in the United States.

The Americans were the first to realize the opportunities which the Philippines offered for the establishing of large sugar centrals.

The first large central was erected by Americans who made a contract with the Government for the purchase of a large



A PRIMITIVE MILL UNIVERSITY OF CALIFORNIA

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HONOLULU

#### MANUFACTURERS

#### CONTRACTING ENGINEERS CONSULTING ENGINEERS

#### COMPLETE SUGAR FACTORIES & EQUIPMENT

H I W FACTORIES OPERATING IN THE PHILIPPINES:

Calamba Sugar Estate 1,800 Tons San Carlos Milling Co. 1,000 Tons North Negros Sugar Co. 800 Tons

Mindoro Sugar Co. 800 Tons San Isidro Central 250 Tons

H. I. W. FACTORIES BUILDING IN THE PHILIPPINES:

Central del Carmen 1.500 Tons Central Azuzarera de Baiz 1.000 Tons Central Azuzarera de la Carlota 1000 Tons

WE GUARANTEE THE SPECIFIED CAPACITY OF OUR SUGAR FACTORIES

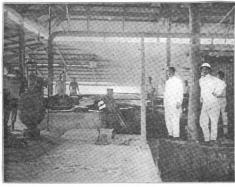
THE GUARANTEE CAPACITIES HAVE BEEN EXCEEDED IN ALL OUR FACTORIES IN THE P. I.

TELEPHONE 1629

MANILA OFFICE

CHACO BUILDING





INTERIOR OF A SMALL SUGAR MILL

At the same time other modern factories of smaller size were erected on Negros, Luzon

and Panay, i. e.: A factory built on the Roxas estate, and a factory built by the clergy near Calamba, both on Luzon, a factory at Tigbauan on Panay and several factories on Negros, one at Talisay and one at Bago, these being build by Sr. de la Rama without help from Americans or Europeans, one at Hinigiran by Senator Guanco and one at Kabankalan by Lizarraga Hermanos.

All of these have sugar plantations and factories combined.

During the war the high prices of sugar made investors willing to venture in new enterprises, in spite of the high cost of machinery, especially as the end of the war seemed far off in 1916.

Mr. M. J. Ossorio ordered a central to be put in the Manapla district North Negros and later the Pampanga Sugar Mills, placed and nater the rampanga Sugar Wins, placed their order for a factory to be erected in Florida Blanca, Pampanga province, Luzon. In 1915 a law was passed authorizing the National Bank of the Philippines to give practically unlimited credit for the erection of sugar mills against mortgages on machinery and farms and the first central, thus financed, partly consisting of old machinery, was ordered for the Isabela district and was soon followed by orders for a string of large new centrals, most of them for Negros, and ranging in capacity from 600 to 1,500 tons of cane per 24 hours, and all designed for All the planters are now condoubling. vinced that the only way to prosper is to have a central to crush the cane, especially as the bottom is dropping out of the "mus-

As the price of living and labor and fire-As the price or living and labor and me-wood has gone up, many planters cannot produce "muscovado" in their little mills at a profit, in spite of the increased price for "muscovado" fixed by the United States Government, and to facilitate the erection of centrals was the only way in which the sugar planters could be saved from bankrupt-

covado" market in China, the Chinese prefer-ring the centrifugal sugar of about 96 per

cent polarization.

cy.

The following list gives the centrifugal sugar factories at present working or building in the Philippines and the principal items of their equipment:

A trick Cappiners. Beig.—Bals, Negro Coccitis (1000 tons care per day Bulling, Honolate
school (1000 tons care per day Bulling, Honolate
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effect; coil vacuum pan; 3 Å 30 inch centriugals; 3 filter-presses.

4. Calabna, Seger Estate. Canlubang, Laguna.

4. Calabna, Seger Estate. Canlubang, 1900 tons cane per day. Began operation Deember, 1904. Ho-nolulu Iron Works Co.; 2 sets cane knives; crusher, 12-roller mill 34x78; 7 multitubular boilers; 1 Sterling, 2 IV effects; 4 calandria pans; 22 crystallisers; 21 40 nch centriugals; 18 filter presses.

5. Corver Corbol.—Calatagas, Battenges, Microscer, J. M. Gentano, Manila, P. I., Cancirix, 2006 tone cane per day. Began operation February, 1914. McNell; crusher, 9-roller mill, 2042; in autitophalic Manile Corporation of the Corporation of Corporation o

4 30-inch. centrifugai; 6 filter presses. Alcohol distillery attaches. Norso Occidental.

71. Dr. la Rama Cartal.—Baso, Norso Occidental.

71. Dr. la Rama Cartal.—Baso, Norso Occidental.

71. Dr. la Rama Cartal.

71. D

tubulair boilers, III effect; coil pan; 2 20-inch cen-trifugals; 3 fiber-presses.

9. Guanco Central (Macdalena).—Hinigaran, Neg-ros Ocedental. Manager, S. Ortega. Caparity, 230 tons cane per day. Began operation 1913. Geo. Squier Mig. Co.; crusher. 9-70leer mill 20x36; 3 multitubulair boilers. III effect; Cali pan; 6 crystallisers; 6 30-inch centrifugals; 4 filter

De la Cambra, de

bollers; open frant eventories (ori jan.) 4 30-inch

La Carlota.—La Carlota, Pergo Occidental.

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centrifugals; 2 filter preses.

16. North Kergos Sugar Co.—Manapla, Negros Occidental. Manager, F. E. Greenfield. Capacity, 800 tons of cane per day. Began operation July, 1918. Honolulu Iron Works Co.; 2 crushers. 2 9-rollers mill 20x34-inches 4 multitubular bollers; 1 Sterling, 2 111 effects. 3 calandria pans; 18 crystaliers; 10 30-inch and 4 40-inch centrifugals; 6 filter

Nueva Apoloma Sugar Factory.—Valle Negros Occidental. Manager, De la



QUADRUPLE EFFECTS AT CALAMBA CENTRAL



SACKING AND WEIGHING APPARATUS CALAMBA SUGAR PACTORY

Capacity, 90 tons cane per day. Began operation in 1917. Assembled; 3-roller mill, 26x48 2 multitubular

Languery, wo frant came per day. Regan operation in bookers, own train everportage; cell part 1 30-feet. 18. February 2018. 19. February 2018. 19.

dria pans; 18 crystallisers, 18 40-inch centrifugals; 21, Philippies Stage Development, Co.—Calamba, Laguna. Capacity, 300 tons cane per day. Bean oper-action March, 1918 on the Stage of the Stage of

23. San Antonio Central.—La Carlota, Negros Occidental. Manager. Antonio Urquijo, Iloilo, Cayacity, 150 tons cane per day. Began operation 1913. Assembled; 6-roller mill, 20x36 and 24x42 inches, 2 multitubular boilers, V effect; coil pan; 4 30 inch centrifugals; 3 filter presses.

4 90 inch centritugais; 3 litter presses.
24. Saw Galos Milling Co.—San Carlos, Negros Occidental. Manager, T. E. Kruseman. Capacity, 1800 tons cane per day. Began operation January, 1914. Honolulu Iron Works Co.; crusher, 9-roller 1911. 34x72 inches; 7 multitubulair boilers, IV effect; J calandria pans; 12 crystallisers; 19 40-inch centrifugais; 10 filter presses.

10gas; to inter presses.
25. Sen Jisho Central.—Cabancalan, Negros Oxcidental. Manager, Juan Vidaurrazaga. Capatity, 250 tons cane per day. Began operation February, 1914. Honolulu Iron Works Co.; crusher.
6 roller mill 20x8 inches; 2 multitubulari boliers, III effect, coil vacuum pan; 6 crystallisers; 5 30-inch centrifugals; 3 filter presses.

centrifugals; 3 filter presses.

26. Tatisay Central.—Talisay, Negros Occidental.
Manager, R. de la Rama, Hollo. Capacity, 100 London
foroller mill 19203-linches; 3 multitubulair boilers,
111 effect; coil pan; 2 crystallisers; 3 30-inch centrirugals; 2 filter-presses.
27. Tutigon Fadory.—Tutigan, Bobol. Capactry, 50 tons cane per day. Began operation 1918.

ity, \$0 tons. Closed down.

From this list it is evident that all the large centrals are, as could be expected of American manufacture, most being of Honolulu Iron Works Co. manufacture.

All these mills are similar in type to the

Hawaiian factories, built by the Honolulu Iron Works and which are so successful in operation.

Some of the earlier centrals were slightly out of balance, as it proved that Philippine canes were easier to crush than most of the Hawaiian varieties but the Honolulu Iron Works soon adjusted their factories to suit the local conditions and the results in most of the large centrals are now equal to those attained in the Hawaiian factories and the guaranteed capacity has in all instances been exceeded.

The Honolulu Iron Works, in their desire to adjust their machinery to Pilippine condi-tions and requirements, have also designed another type of factory, more suitable for the tropical climate of the Philippines and better able to withstand typhoons or earth tremors.

This type, which is an improvement to the general type of factory, as seen in Java, is expected to be built shortly.

English and Scottish machinery is only installed in the smaller mills and it would therefore be unfair to make comparisons between American and foreign installations.

The modern sugar factories usually make



MODERN TRANSPORTATION, CALAMBA SUGAR ESTATE

96 degrees test sugar for the American refine-

Some of the small factories have recently tried to make washed whites or plantation whites, for local consumption.

There is no reason why some of the cen-trals should not be able to make a success of this, applying the single or double sulputa-tion process as in Java, Natal, and Mauritius. These processes require, however, a very sharp chemical control and are even then often disastrous to part of the equipment, whilst the output of the boiling house is con-

siderably reduced. Whether or not it will be advisable to make plantation whites in a central depends chiefly on the existing equipment and the location

of the factory. The same applies to the remelting of muscovados" in the sugar centrals.

This has been a paying proposition in some factories and a failure in others, and is entirely influenced by the following factors:

1. Buying of "muscovado" and selling of centrifugal sugar

Cost of surplus fuel. Location of factory.

4. Proportion of capacity between crush-

ing plant and boiling house.

FACTORY PERSONNEL The great difficulty in a quickly expanding industry is always the lack of trained person-





AN UNCROWNED QUEEN



The Philippines are suffering and will suffer for several years from lack of properly trained engineers and chemists to operate the new centrals.

The result is that often "one eye is king in the land of the blind" and salaries high.

It is necessary to have first class men in charge of first class installations and it will be necessary to import several experts from other countries to manage and operate the new centrals.

Experience is necessary, combined with scholastic training, to make a successful

operator.

Several Filipinos are already studying engineering and chemistry in foreign countries and in another few years they will have acquired the experience necessary to operate large centrals.

There can be no doubt that there is a great future in the Philippines for anybody who has made a special study of, and has worked at, the manufacture of sugar from sugar cane.

LABOR

In normal conditions labor is sufficient, although not abundant.

In harvest time there is the usual shortage, as practically all the cultivation and industries are dependent on hand labor.

There is, of course, a lack of trained factory labor, but this is improving gradually.

As more laborers pass through the existing centrals, more get a preliminary training and in the course of years there will be no lack of factory laborers, whilst the field labor can be lightened by the use of mechanical implements.

At present, however, there is no doubt that the sugar industry would greatly benefit by the importation of foreign artisans and laborers, Chinese or Japanese.

At present the pay of day laborers is around 55 centavos per day, for women around 25 centavos.

#### CANE CULTIVATION

The varieties of cane grown in the Philippines are about 5 in number and of various colors, including yellow, green, pink, red and very dark red.

The Bureau of Agriculture has introduced several varieties far superior to the native ones, but the Filipino planters are slow to adopt these as they are more difficult to crush and the lanky canes produce not so good a crystal in the "muscovado" process.

The building of centrals will, however, change this as it is to the advantage of the planters to have a large tonnage per acre and the crushing and making of sugar crystals are no concern of his.

#### SOIL PREPARATION

The soil is plowed 2-3 times as soon as the wet season is over, mostly with very primitive single mill board plow drawn by one carabao.

After the plowing, a harrow is used to

break the ground well up.

On the large plantations steam plows are used or large tractor plows whilst recently the centrals do a lot of plowing for their hacenderos with small and large tractor plows, to insure that a sufficient area is planted for the requirements of the central.

#### PLANTING

Planting is done by hand using the tops of the canes, cut in lengths of 6-8 inches called points.

These receive a preliminary soaking in water and are planted in furrows made with the same primitive plow, at distances of 30 inches up to 6 feet and using 3 points to the meter.

The planting is usually started early in December and continues for about 5 months.

The points are stuck in the ground under an angle of 45 degrees and usually pushed in the ground with the heel.

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If the soil is too hard, a pointed stick is used to drill'a hole.

No watering is done, weeds are kept down by ploughing between the rows, or by hoe.

The cane is entirely dependent on the rainfall which varies somewhat from year to year.

Manuring is practically unknown.

#### HARVESTING

Harvesting is done entirely by hand. The cane stalks are stripped of the leaves and cut off, near the ground.

The tops are cut off for planting or cattle feed and the cane transported to the factories by carabao sleds, carts or railway. In a few instances the cane is hauled in motor trucks.

#### **RATOONING**

The cane is ratooned or not, according to the location and in few cases more than 3 times. To increase the stooling the first shoots

from the ratoons are sometimes broken down. Some cultivation is done between the cane rows with plow or hoe.

#### DISEASES AND PESTS

The canes in the Philippines are practically free from contagious or infectious diseases. Those diseases that have appeared could al-

ways be traced to negligence in cultivation. There are very few wild animals and damage from that source is negligible and there are also no small animal pests of any importance.

Generally speaking, cane growing is not handicapped in the Philippines.

#### QUALITY OF CANE

The quality of the canes differs largely, according to the locality and the weather conditions.

Generally speaking, however, one may say that the Philippine canes are as good, if not better, than any cane raised in a similar latitude.

The dry season starts from one to two months before the harvesting begins which permits the cane to attain a very high purity after 12 months. Purities of over 90° are not rare.

The average purity runs about 80 to 85, the sugar content between 12 and 16 per cent.

### CRUSHING SEASON

The crushing season varies according to the locality. On Luzon, crushing starts in the latter part of November, on Negros generally not before December.

The season generally lasts from 4-6 months, except in the north of Negros, where it is possible to crush 8-10 months with satisfactory results.

The Bureau of Agriculture has recently issued its Bulletin No. 39 "Cane Production and Sugar Manufacture in the Philippine Islands", compiled by Mr. C. W. Hines, sugar expert of this Bureau.

This Bulletin deals with every detail of the industry and gives the fullest information to everybody interested in the growing of sugar or the making of sugar.

#### **FUTURE**

There can be no doubt that the cane sugar industry will develop in the near future with giant strides, both through the expansion of the existing or building centrals and through the building of new centrals.

It was already possible, without the help of irrigation or intensive cultivation and with most primitive installations for manufacture, to produce sugar which could compete in price on the world markets, and that in spite of bad means of communications and the indebtedness of the planters.

Now, with the assistance of practically unlimited capital and guidance for planters to increase yields and combat diseases, there is no reason why the Philippines should not come into the foremost rank of the sugar-producing countries.

A few years ago the sugar industry of the Philippines was more than 30 years behind in development, compared to the Hawaiian Islands and Java, but now it can be their equal if not their superior.

Scientific cultivation, seed cane selection, manuring and irrigation can increase the yields at least two-fold.

The sugar bureau in Iloilo, a branch of the Bureau of Agriculture, has worked for years to instruct planters how to increase their yields, but few have availed themselves of the advice,—lack of money often being the principal reason and ignorance another.

Several planters refused to manure their cane, as they considered that the long canes yielded "muscovado" of a lesser quality.

The erection of the centrals will put the planters in a better financial position and the central will encourage everything leading to increased tonnage per acre.

There is a decided tendency in the areas where centrals are erected to increase the yields and improve the qualities of the cane.

Irrigation waters are available in abundance, and although labor is not abundant, this is also the case in Cuba, which island is handicapped by lack of irrigation and yet produces more sugar than any other country in the world.

The area of lands capable of producing sugar on Luzon, Mindoro, Panay, Negros, and Cebu, is merely scratched and the total area is in excess of Cuba or Java.

A future sugar production of one million tons per year is not impossible for the Philippines.

## Hemp Industry

(Continued from page 53)

or rolled on bobbins or spools. About 3 per cent of the supply of abacá is used for tagal braid.

Recent development of the industry. From the early history of the abacá industry until the present time the production of fiber has increased steadily. Unfortunately, however, this increase in production was not the result of, nor was it accompanied by, any general improvement in the cultivation of the plant or in plantation management. Until a short time ago, and in a large measure even at the present time, the bulk of production is the product of small plantings in which old and crude methods of cultivation and fiber extraction have been used. Under such conditions, therefore, it is not surprising that for a long time it was the belief that the cultivation and production of abacá was not an industry that could be profitably carried on by the use of systematic and modern methods of agriculture.

Since 1903, however, several large plantations have been established in different localities and improved methods used in the cultivation of the plant and in general management. The results have shown that the abacá industry can be made one of the most profitable branches of investment for the tropical agriculturist. The abacá plant responds freely to careful and methodical treatment by a considerable increase in the yield of fiber, and the carefully extracted fiber commands a steady demand and a high price, even during the so-called dull periods of the market. As a result of this investigation there has recently been a tendency toward the substitution of modern methods of culture and management to replace the former wasteful and antiquated practices.

The opportunity for the extension of the abacá industry of the Philippines, not so much in an increase in the area cultivated or an increase in production, but in an increase in the yield of plants and an improvement in the quality of the product, is very promising. With but little or no danger from insect pests or plant diseases and with but little or no competition from other countries, abacá is an eminently safe crop and affords one of the most profitable branches of agriculture in the Philippines.

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## The Philippines in Facts and Figures

#### HISTORICAL **PRE-SPANISH**

Early Philippine history fades away into the history of Chinese foreign adventure and commerce, trading having been carried on between the two countries for a thousand years prior to the Spanish conquest.

#### **SPANISH**

Magallanes discovered the Philippines in 1521, about 100 years before the Pilgrim Fathers landed at Plymouth Rock. Spaniards settled Cebu, 1568. Legaspi occupied Manila, 1570. British ptured Manila, 1762.

#### **AMERICAN**

United States occupied Manila August 13, 1898. Treaty of Paris signed December 10, 1898. Filipino insurrection began February 4, 1899. First provincial government organized (Pampanga), February 6, 1901. First American Civil Governor, William H. Taft, July 1, 1901. Philippine Act passed July 1, 1902. Jones Act passed August 29, 1916.

#### **GEOGRAPHY**

The Philippine Archipelago extends from the Batanes Islands in the north to the Tawitawi group at the southern end of the Sulu islands, a distance of 1,152 miles.

The archipelago is composed of 3,141 islands, of which 400 are inhabited.

#### DEPTH OF SEAS

Interisland: Average, 75 fathoms; maximum, 500 fathoms. High seas: Maximum depth is on southern coast of Mindanao, 5,000 meters, or about 3 miles. Jolo sea: 4,069 meters. Coast line: 11,444 miles. Manila Bay, circumference, 100 miles.

#### DIFFERENCES IN TIME

-	Manila is in advance of-	
•	London	8 hrs. 03 min.
	New York	12 hrs. 59 min.

New York	12 hrs. 59 min.
San Francisco	16 hrs. 11 min
Washington	13 hrs. 00 min
_	

#### AREA OF ARCHIPELAGO

	re mnes.
Total area, land and water	832,968
Land	
Water	

#### COMPARATIVE AREAS

Squa	re miles.
Philippines	127,853
British Isles	120,973
New York, New Jersey, Pennsylva-	•
nia, and Delaware	104,970
Japan	

Luzon island is as large as Denmark, Belgium, and Holland combined. Mindanao is about equal in area to Por-

tugal. DISTRIBUTION OF AREA

Squa	are miles.
Forest land	
Commercial forest	61,000
Cultivated	14,000
Grass lands	20,000
Unexplored	14,000

Forest lands contain some 747 native tree species; 50 to the acre in some parts. Mindanao has 423 varieties. Over 200 varieties come to the Manila market. One-half of the forest land is virgin.

#### CULTIVATED LAND

	Acres.
Rice	3,000,000
Hemp	1,236,000
Coconuts	680,000
Corn	
Tobacco	145,000
Sugar	,
Maguey	
Cacao	*
Coffee	2,000

#### COMPARATIVE CULTIVATION

Japan and the Philippines: Japan with 14-000,000 acres of arable land produces crops to the value of \$\mathbb{P}2,000,000,000. Philippines with 7,000,000 acres produces only \$200,-000,000.

#### **POPULATION**

Total from latest (1917-18) Philippine Health Service records: 9,500,000.

,	
Christians	8,730,000
Mohammedans	275,000
Non-Christians and Pagans	595,000
Japanese	42,800,000

#### PROGRESS OF POPULATION IN PHILIPPINES

1735	837,182
1805	
1826	
1840	3,096,031
1862	
1887	
1896	6,261,339
1903	
1917-18	9,500,000

#### CLIMATE

Average temperature for 30 years: 80° Fahrenheit.

Dry temperate months: November, December, January, and February.

Intermediate months: March, July, August, September, October.

Hot months: May and June.

#### RAINFALL

Maximum days of rain in July, August, September.

Minimum days of rain in February and March.

Dry season: November to May, inclusive. Wet season: June to October, inclusive. Typhoons: Frequent in July, August, September, and October.

#### MOUNTAINS

Feet.

Apo			 10,312
Pulog			9,450
Mayon			8,970
Halcon			8,865
Malindang			8,197
Canlaon			8,192
Sto. Toma			7,418
Data			7,364
Banajao			7,382
Pagsan			7,339
Isarog			6,450
Pinalobo		<b></b>	 6,137
Cristobal.		<b></b> .	 5,288
Bulusan		. <b></b> .	 5,100
Maquiling.	. <b></b> .		 4,783
Arayat		. <b></b> .	 3,564
Talim		. <b></b>	 1,519
Taal			 1,050

There are 50 volcanos in the archipelago, of which 20 are active and 30 are extinct.

The principal active volcanos are Taal, Canloan, and Apo.

The principal extinct volcanos are Talim, Maquiling, Cristobal, Banajao, and Isarog.

#### RIVERS

-	Miles
Grande de Pampanga	220
Pulangi, Mindanao	300

Other rivers of importance are the Agno Grande, Grande de Pampanga, Agusan, and Pasig.

Mindoro has 60 rivers and Samar 26, none of them of commercial value.

#### REAL ESTATE VALUES [1 peso=\$0.50]

Manila Provinces	
MORTALITY (AMERICANS A	ND EUROPEANS
PER 1,000 (19)	17-18)
Manila	8.0
New York	
San Francisco	
Chicago	14.0
Glasgow	18.0

## Climate

No feature of life in the Philippines has been more maligned than the long-suffering climate. Every prospective tourist to the Orient has been treated to a ten-course menu of stock stories of the unbearable heat, the destructive typhoons, the fearful earthquakes, and the general dreary dead level of death and disease that follows in the wake of the pestilential climate. Imaginative exiles have helped along this repertory by inventing lurid stories of departed exiles who woke up in the fires of the nether world and shouted for some one to shut the door and let it warm up a little.

Climate, so far as the most of us are concerned with it, is composed of four elements. Temperature, humidity, purity of the air, and environment are the things that make a country habitable or otherwise. All the different varieties of climate on the globe can be made to order anywhere that the proper ingredients of temperature, moisture, and air can be got together. This may be heresy to those who live by exploiting the invisible virtues of some particular climate the land under which they may have for sale—but it will stand the test of scientific

demonstration. The climate of the Philippines, broadly speaking, is the most healthful and comfortable of any portion of the Tropics inhabited by man. Compared in detail with the climate of New York, or Chicago, or St. Louis it has many points to the good,

and really very few on the wrong side of the scale. There is a complete absence of extremes of temperature. Except at the highest altitudes, frost is unknown; and in the hottest places sunstroke is also unheard of. The limit of the upward tendency of the thermometer is 100 degrees Fahrenheit. The total annual variation is not more than 40 degrees. It is simply summer all the year, and nine months of it is very pleasant summer. December, January, half of November, and February furnish the most delightful climatic conditions in the world. It is neither hot nor cold, but "just right" all the time. The very air breathes the luxury of nonresistance to nature; and if ever life is worth living anywhere, it is here. Toward the 1st of March it begins to warm up. The Thermometer daily climbs a little higher, and there may be a week when the noon time is suggestive of those hot spring days in the States, when the unaccustomed heat is hard to bear. Sunset finds pleasant evenings and nights cool enough to sleep well.

About June the rains begin, and with them comes relief from heat, for when it is raining in Manila it is always comfortable. The "wet season" is the most comfortable time of the year, and if one does not have to do too much provincial traveling, he has nothing to dread from the rain. Alternate showers, clouds, and clearings fill the months till November, when the rain gradually gives away and the delightful "winter" comes again.

Such is the year in Manila. This routine, however, varies somewhat in different parts of the Islands and with different years, but the average will not vary much from this outline.

In a climate with as high average humidity as that which prevails in the Islands, the question of comfort is nine-tenths a matter of finding and keeping in a breeze. Even a gentle zephyr means perfect comfort, while stillness of air means torture with the temperature unchanged. And here is the great advantage of the Philippines. There

(Continued on page 80)

# Some Industrial Possibilities of the Philippine Islands

By Dr. Alvin J. Cox, Director of the Bureau of Science

Being a Memorandum prepared for the information of the Secretary of the Interior.

(The Philippine Bureau of Science; Manila, P. I., has available for those interested detailed information regarding each of these industries. Inquiries may be addressed to the Director, Bureau of Science, Manila.—THE EDITOR.)

A few days ago you requested a memorandum with regard to industrial, economic or sanitary information in the Bureau of Science which has to do with the development of the Philippine Islands which is insufficiently used and which should be carried further to make it of the greatest benefit. I desire to emphasize the fact that there is extensive information along many lines in the Bureau of Science which effect a large annual saving to the inhabitants of these Islands if it were utilized. Some of this has been published and is of permanent record, but the time of employees is so taken up with the regular work of the Bureau that there is still insufficient publicity. The means at hand are entirely inadequate to put the people of these Islands in touch with the information of the Bureau of Science. The best, and, probably, the only way most to interest those to whom the introduction of new methods and of desirable modifications of existing methods is most important is by actual demonstration. All of the information which the Bureau of Science has been able to collect and work out along lines all tending to improve sanitary conditions, to develop the valuable resources of the Philippine Islands, and to develop both old and new industries—work which should be carried on at all times—has been accomplished after the regular routine work of the Government, consisting of hundreds of thousands of different examinations, analyses and jobs of every variety, and coming from every branch of the Government, has been attended to. Some of the subjects along the line in which you have expressed an interest are as follows:

- 1. Paper pulp.—In the paper-pulp industry there has been an advance in the cost of all raw materials and there seems to be no immediate prospect of a change in the situation. The great industries in the United States alone are demanding, and will continue to demand, a supply of paper pulp much in excess of the consumption previous to 1916. The demand will tax the capacity of the mills there to the utmost.
- 2. Drying coconut by sulphur treatment.— This method of drying coconuts is exceedingly simple and consists, briefly, in putting the opened nuts on trays and subjecting them in a closed space to the fumes of burning sulphur for from twelve to twenty-four hours. After this treatment the nuts are put under a shed to dry, the completion of which requires four or more days according to atmospheric conditions. The only apparatus required is a wooden box of proper size, a few trays, and a 4-wheel car mounted on a wooden track. The box is made sufficiently tight only to permit the escape of enough gases to allow enough additional air to enter at the bottom to keep the sulphur burning. The box is 105 by 210 by 270 centimeters, being of sufficient size to accommodate about 1,500 nuts on 16 or more trays when placed on the car and separated enough to permit free circulation of sulphur dioxide fumes. One end of the box is a door hinged at the top. The car has the simplest framework mounted on two pairs of cast iron wheels 25 centime-

twice as long as the box, so that the car may be pushed in and out of the box and the loading and unloading be done outside. About 5 kilograms of sulphur are sufficient for one thousand nuts, and when these nuts are put on trays, they occupy about 2.5 square meters of floor space.

There is no doubt an available supply of sulphur. I have estimated that the annual production of coconuts in the Philippine Islands does not exceed 431,387 thousand nuts. If all the nuts grown in the Philippine Islands were cured by the use of our sulphuring process, not more than 2,000 tons of sulphur would be consumed annually. In 1915 the United States Geological Survey reports that during the calendar years 1911-14 Japan exported to the United States 16,185, 24,505, 15,317, and 21,913 tons of sulphur, respectively. From this it will be seen that Japan annually imports into the United States alone ten times as much sulphur as would be required for sulphuring all the coconuts of the Philippine Islands. Sulphur is also available in the Philippine Islands as shown in the Bureau of Science Mineral Resources for 1911. A demand would develop the Philippine sulphur resources, but even though no sulphur were available locally, it could be imported into the Philippines cheaper than into the United States. The average price of sulphur should not exceed 50 pesos per ton under normal conditions.

In the tapahan method of drying copra it frequently happens that the coconut meat begins to mold before the drying is begun, and before the drying has proceeded far enough to inhibit the growth of mold, considerable deterioration has taken place. In the sulphuring process the nuts can be subjected to sulphur fumes before mold has started to grow. The action of sulphur fumes (sulphur dioxide, sulphuric acid anhydride) is to kill all mold spores and to soften the cell walls of the coconut meat so that the moisture comes out readily.

With proper organization and routing of the work, the labor cost when the sulphur method is used will not exceed that in the tapahan. Compared with the tapahan method the sulphur process offers the following advantages:

(1) The copra is preserved and bleached by the sulphur fumes and yields exceptionally white copra.

(2) There is no loss of oil during the process of sulphuring and drying.

(3) An exceedingly uniform product is obtained.

(4) A greater weight of copra is obtained

from a given number of nuts.

(5) The keeping quality of the copra is improved.

(6) The process is exceptionally clean.
(7) The oil expressed from the copra is practically colorless, is free from rancidity, is pronounced equal to, or better than, the best Cochin oil, and will sell for two or three cents a pound more than ordinary oil (at two cents a pound there is a difference of about

3.75 pesos per picul of copra).

The disadvantages of the sulphur method are:

(1) A small outlay for sulphur.
 (2) A longer time is required for drying.

The expense of sulphur is negligible and is probably more than counterbalanced by the increased weight of the product owing to the fact that there is no deterioration of the oil by organisms, not to mention the numerous other advantages. The length of time required is more than counterbalanced by the superior product which will command a much better price when produced in sufficient quantities so that it may be manufactured into edible oils.

3. Papaya gum.—A study of the properties of papaya gum made from latex of Carica papaya has resulted in improving methods for preparing this important commercial product. The results already obtained show conclusively that gum may be made in the Philippines which is equal, if not superior, both regarding color and activity, to any now on the world's market. The constantly increasing demand for papaya gum as a substitute for pepsin and the well-known fact that satisfactory gum is difficult to obtain assure a steady market for a high-grade Philippine product.

When I was in the United States in 1915, I discussed papaya gum especially with Dr. J. M. Francis, of the Parke Davis Co., Detroit, Michigan. He says it is impossible to get any unadulterated papaya gum in the United States. One very active sample which they received contained 48 per cent starch 50 per cent papain, and 2 per cent pepsin. Doctor Francis says that the consumption of papaya gum in the United States alone amounts to several hundred tons annually and will increase, if a reliable product can be obtained. American firms have been discouraged in this industry by the adulterated products. The American Digestive Ferments Co., New York City, is another firm dealing in papain.

In 1915 I wrote to the United States Bureau of Chemistry asking them to endeavor to stop the importation of adulterated papain, and, when this is done, there will be no demoralization of the market.

4. Tanning materials.—The value of tanning materials imported into the United States has increased from 1,600,000 dollars in 1900 to 6,500,000 dollars in 1911, and tanners are becoming each year more dependent upon imported material. Bark from the better species of Philippine mangrove trees contains 30 per cent of tannin, and a net profit of from 50 to 60 pesos per ton can probably be made on tanning material derived from the mangrove swamps in the Philippine Islands. The commercial development of the Philippine mangrove swamp areas, estimated at 207,000 hectares or 2 per cent of the Philippine public forests, is possible. The exploitation of these mangrove swamps involves an economical disposal of the wood. This can be done if the tanning industry is associated with a firewood, piling, and distillation industry. The Bureau of Science has completed, and is about to publish, results on the destructive distillation of Philippine woods, which show a comparatively easy method of disposal of wood at a profit and one which produces valuable products such as acetic acid, methyl alcohol, tar, and excellent foundry charcoal, provided a suitable market for the products is established.

The installation of a distillation plant would prove a decided advantage and stimulus to the tan-bark industry, for it could utilize all the wood in a certain area, and consequently trees of all sizes yielding valuable tan bark could be stripped. All the species of mangrove of any importance in the eastern tropics are found in the Philippine Islands and the opportunity for a profitable

cutch industry is very great.

The extended use of mangrove bark and more particularly mangrove extract is comparatively a recent development, the use of both of these should be greatly extended in the Philippine Islands. Camachile bark used almost exclusively by Filipino tanners is costly and limited in supply, whereas mangrove bark is plentiful, cheap, and high in tannin content. The latter produces a darkred leather and has been viewed with disfavor by Filipino tanners. The Bureau of Science has demonstrated that good, lightcolored leathers can be produced by combining mangrove and camachile, and a considerable saving in the cost of tanning can thus be effected. Recent investigations by the Bureau of Science of a number of possible tanning materials have shown that at least two barks, Benguet pine and palomaria, can be utilized commercially and may assist in the conservation of the supply of camachile bark. Palomaria is more abundant and more readily secured on a commercial scale than camachile.

5. Leather.—The scope and possibilities of the tanning industry in the Philippine Islands may be inferred from the fact that about 4,000,000 pesos' worth of leather is used annually. More than half of this demand is met by importation. Large number of hides and skins go to waste in the Philippine Islands each year owing to the scarcity of tanneries which might utilize them. The tanneries which do exist employ primitive methods—practically without modifications, those introduced centuries ago by the Chinese—and the leather produced is of an inferior quality. The Bureau of Science had devised methods for preventing putrefaction of hides during the tanning process and has demonstrated that improvements can be put into effect in a Filipino tannery without modification of the equipment and with little increase in expense, which will yield about 32 per cent more leather of higher grade than that now produced. Leather produced by the improved process is firm, of a satisfactory color and grain, and free from the disagreable odor or evidence of putrefaction and other principal defects of native leather. Much of this work was performed in operating tanneries. It is my desire to extend this practical demonstration to tanners and thus enable them to judge the merits of various processes for themselves and to make improvements in their own establishments. For the present, ample inprovement may be made without greatly changing their equipment or without increased outlay. The work of the Bureau of Science on tanning should have a very beneficial effect on the Philippine tanning industry.

6. Philippine dys.—Under normal conditions artificial dyes have largely supplanted natural materials. In some districts there occur natural dyes of sufficient brillancy, permanency, and quantity, to be very valuable. They are employed in the dyeing of native fibers for the manufacture of hats, mats, baskets, cloth, etc. A number of these dyes have been investigated, and the results

Intense cultivation of plants containing valuable color principles is necessary for success other than for local use. The two most important dye plants found in the Philippines are the well-known indice and some

have been published.

ippines are the well-known indigo and sapan or sibucao. It is possible that the extranatural indigo might be profitable at the present time, but under normal conditions it is

hard to compete with the cheaper coal-tar product. The sapan, which grows in great abundance on Guimaras Island and parts of Panay, is a widely scattered tree in the Philippine Islands. Its valuable properties yield a red dye, and considerable quantities are annually exported to southern China. The Bureau of Science has shown that the wood contains Brazilian, the coloring matter found in Brazilian wood. By extraction with water this wood yields about 2 per cent

of coloring matter.

7. Cane sugar.—The production of sugar ranks among the most important industries of the Philippine Islands, and Negros and Panay, particularly the former, are the most important islands of the Archipelago in point of sugar production. These two islands produce about 190,000,000 kilograms annually, 90 per cent of which is muscavado or molasses sugar. As muscavado sugar, this represents an average value of 15,000,000 pesos and would be worth double this amount as 96° sugar. The Bureau of Science has shown that from 20 to 35 per cent of the sucrose of the cane is lost in many mills in Negros through the poor milling facilities and the antiquated methods of handling cane and juice. Since that time the Bureau of Science has assisted the planters to increase their extraction and better their product. Results have been published showing the financial loss due to harvesting unripe cane and to demonstrate that if this is avoided even in antiquated mills an actual loss can be converted into a material gain. Information on La fabricacion del azucar de caña, the melting and reboiling of muscavado sugar, and the manufacture of 96° sugar by means of open kettles and vacuum pans has been published. As a result of the work of the Bureau of Science, much raw sugar is now polarized before exportation and sold upon its sugar content where heretofore the valuation was all made by the purchaser upon receipt. There are over five hundred sugar haciendas in Negros. It is my desire to increase the extraction and introduce more careful methods of handling the juice in these haciendas which should increase the production and improve the quality of sugar even if there be no increase in the yield or in the planted area. During the past season the Bureau of Science has had a traveling labortory in Negros by means of which the cane has been tested from one end of the island to the other. There is no marked difference in purity value or in the quality of the sugar produced. The cane has been almost invariably of good quality and the sugar from good to poor, depending upon the manner in which it was manufactured. In principle I am opposed to the introduction of expensive machinery in the Philippine Islands if the apparatus already in use can be made serviceable, but it is very difficult to make better muscavado sugar. The installation of modern sugar machinery for the manufacture of centrifugal sugar is practically necessary. Central mills are a geat advantage, for their installation leaves the planter to attend to his fields and to problems of fertilization and irrigation. We have encouraged the use of guano from local caves, the use of which has greatly increased. Guano is a cheap and efficient fertilizer for cane fields. Planters who have been encouraged to fertilize and irrigate their haciendas report crop increases of from 60 to 100 per cent. The Bureau of Science has been of considerable assistance to the planters by making reports on each district where cane is planted, and these were of assistance in two districts where central contracts have been let. When time has been available, reports on districts have been made, including information which will be of advantage to those who contemplate the erection of central mills, such as the following: location, description of the land, topography; rainfall, water supply

afforded by rivers, artesian wells, etc.; shipping facilities; quality of cane, yield of sugar; etc. Such information from an unbiased source will influence the investment of capital where it is so badly needed.

In those districts which are too small, the Bureau of Science has encouraged individual planters to manufacture 96° centrifugal sugar by making additions to their present installations. This can be done in many cases at an expense of about 30,000 pesos. To relieve the sugar market of large supplies of muscavado sugar, we have recommended the melting and reboiling of this sugar in the central factories now in operation. This has proved to be very satisfactory and has assisted both the planter and the manufacturer.

8. Nipa palm.—Almost the entire insular production of alcohol—about 10,000,000 proof gallons per year—is made from the sap of the nipa palm, which grows luxuriantly in a number of places in the Philippine Islands. Although extensive nipa swamps exist in the Philippine Islands, only a few are utilized commercially. The alcohol industry has been investigated, and methods for improving the process of manufacture have been described in a number of papers from the Bureau of Science.

The Bureau of Science has discovered that a more profitable manner of utilizing the sap of this palm is in the manufacture of sugar. This is an industry new to the world, and those large tracts of land in northern Panay and elsewhere in which nothing will grow but nipa should be utilized. Nipa sap can be made to yield sugar at a price comparable with cane, and these large areas which are now practically worthless may be turned into productive sugar districts.

9. Palm brandy.—The investigation of alcoholic beverages made from the fermented sap of nipa and coconut palms was undertaken over five years ago. At that time distilled spirits of 100 proof strength were placed in charred barrels. Every six months samples were taken for complete analysis. After a time the analysis began to show promising indications for a staple product. At the present time two casks contain beverages which no longer can be classed as "Vino de Coco" or "Vino de Nipa," but must be acknowledged to be "Philippine Coco Palm Brandy" and "Philippine Nipa Palm Brandy," and are beverages worthy of the name of brandy. The analysis shows them to be well within the requirement for a good quality of brandy. All of the constituents present to make up a good grade of brandy have come to an equilibrium. These beverages have a characteristic flavor due to their origin. Aging for five years in charred casks will produce a beverage from Philippine distilled spirits which in analysis, color, and flavor is comparable to the best grades of imported brandies.

10. Starch.—Starch has many uses other than for food. Starch finds use not only for food, but in calico printing to prevent the color from spreading, for dressing and finishing many textiles, for laundry purposes, as an adhesive paste, as a powder, as a source of alcohol, in the preparation of dextrine and starch sugar, and when sufficiently cheap as a binder for fuel briquettes. It occurs in practically all plants, but not in relatively large enough quantities in most of them to make its extraction profitable. An investigation of a number of starch-producing plants growing in the Philippine Islands has been carried on. Among these may be mentioned tapioca or cassava (Manihot utilissima roman), the native name being camoting cahoy; arrowroot (Maranta arundinacea Linn.); sincamas (Pachyrhizus erosus Urban); the Polynesian arrowroot (Tacca pinnatifida Forst.); yams (Dioscorea; Amorphophallus campanulatus Blume); seeds of Cycus circinalis Linn.; and the sugar palm (Arenga saccharifera Labill.). The most promising of all

these is the cassava, which grows in various parts of the Islands and produces large quantities of starch. Twenty-seven per cent of the weight of the material can be extracted by commercial processes. Cassava needs special treatment to rid it of a glucoside which gives free hydrocyanic acid. This can be done by careful washing, or the glucoside can be rendered harmless by heating. No data are available on the yields of cassava in the Islands, but in Mississippi and Florida, on good ground, 10 tons of roots are obtained per acre. Plants about a year old, selected at random from the district in the neighborhood of Zamboanga, Mindanao, averaged 11 kilograms of roots each, which, planting 1 meter each way, would give a yield of 50 tons per acre. If 10 tons per acre can be obtained in the southern states of America, with a possible growing season of eight to nine months, it would seem to be perfectly fair to figure as much for Philippine soils, with a growing season of twelve months. One acre of ground in the United States will produce 40 bushels of corn containing 680 kilograms of extractable starch. One acre of cassava in the Philippine Islands will produce at least 10 tons of roots containing 2,250 kilograms of extractable starch. This, if converted into alcohol, would yield about 1,500 liters of 95 per cent alcohol. One concern in the Philippine Islands is expecting to enter the cassava industry.

Arrowroot contains from 18 to 22 per cent

of starch.

The machinery for making starch from tubers such as arrowroot or cassava is simple, consisting of scraping and rasping machines, a series of sieves, settling tanks, and drying plates in case a centrifugal dryer is not used.

11. Medicinal plants.—A very large number of plants are used by Filipinos in the treatment of diseases. Datura, dita, sibucao, macabuhay, purging oils, and the fish and arrow poisons have been studied. A few of these are recognized as sources of various medicines in the standard pharmacopoeia. The active constituents of many medicinal plants growing in the Archipelago

have been isolated and identified.

The Bureau of Science is undertaking a survey of Philippine medicinal and poisonous plants. The advantages to be derived by the people from the use of fresh native medicinal plants in place of those imported from abroad which are more or less in a state of decay is readily realized. It is important not only to investigate the medicinal properties of local species actually used by Filipinos in the practice of medicine, but also to investigate local species not now used that are closely allied to those yielding drugs used in other countries. It is also quite probable that during the course of these pharmacological and chemical investigations certain medicinal plants of specific action whose therapeutic values are comparatively unknown at present will be discovered. There are a few commercial species of medicinal plants now known. The St. Ignatius bean (Strychnos ignatii Berg.) yields strychnine and brucine. The species found native only in the Philippines is commercially important for export at the present time. The castor oil plant, croton oil plant, kamala, and datura (as a source of atropine) are very little or not at all utilized, although all grow very luxuriantly and are very abundant. On account of the war, many inquiries have been received recently especially concerning the cultivation of the castor plant. Tangan-tangan, the source of castor oil, occurs as a weed in and about towns throughout the Philippines, yet its cultivation on a commercial scale has never been attempted. There is no reason why this plant should not be grown successfully on a commercial scale and that we discontinue to import our sup-

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ply of castor oil. The same may be said of tuba or macaisa which yields croton oil, and other drug-yielding plants. The work of our medicinal plant survey is to discover the potential commercial medicinal plants of the Islands and encourage the development of the industry and the cultivation of certain standard drug plants by individuals.

of the Philippine Islands, other than coconut, are seldom discussed, though they are very important. Among these are lumbang, kapoc, cashew, castor bean, cotton seed, physic nut, and pili. The production of lumbang oil and of pili nut oil is increasing and are of considerable importance. Other oils now little known will no doubt prove to be of consider-

able commercial value.

13. Rubber.—Some rubber is produced in the Philippine Islands at the present time. not only from introduced cultivated rubber trees of tropical American origin, but also from local species of vines. Recently we have received specimens of first-class rubber from the northern part of Mountain Province produced from an unknown species of vine. The sample of this rubber was shown to a representative of Behn, Meyer & Co., who says it could be graded as No. 1, plantation rubber which, at present New York quotations, is worth 1.58 pesos per pound. The representative in question was quite enthusiastic over the prospect. This product is worth of investigation, and rubber production in the Mountain Province could be developed successfully if the plant occurs in sufficient abundance. The rubber industry could be developed extensively in parts of Mindanao outside of the typhoon region.

14. Rattans.—Many species of rattan grow in the Philippine Islands in abundance. The Malay trade-centers in Singapore, where most of the Sumatran and Bornean supplies are received, are well organized. The Philippine rattan trade is in a very unorganized condition. I believe it to be true that the Filipinos actually buy back their own bejuco from Hongkong after it had been shipped there by way of Singapore. This industry

needs thorough study.

15. Guano.—Guano occurs in limestone caves in nearly every province. Studies made in the past by the Bureau of Science show the guano from many localities to be valuable for fertilizing purposes. The Bureau of Science has encouraged the sugar planters to use this guano. It is beginning to be used to some extent among the sugar planters, who mix their filter-press refuse and ashes with it to put on the cane at the rate of about two tons per hectare. The guano can be delivered to any hacienda for about one fifth the cost of commercial fertilizers. and it has given admirable results. One planter in the Silay district increased his crop nearly 100 per cent by the use of guano.

16. Iron and iron ore.—Valuable deposits of high-grade hematite and limonite are found in several places in the Philippine Islands. The three principal deposits are near the towns of Sibul Springs and Angat, Bulacan Province; Mambulao, Camarines; and in northeastern Surigao between Gigaquit and Cantilan. These deposits are undeveloped, but they have been carefully examined by the geologists of the Bureau of Science, who report the measurement of over 500,000,-000 metric tons of available ore. The iron produced annually from the Bulacan ores by native smelters amounts to over 100 tons. The Camarines deposit is one of the richest of high grade available and is ideally situated for water transportation of the ore. The Surigao deposit is one of the largest undeveloped deposits in the world. Four hundred ninety-seven million eight hundred thousand metric tons of ore have been drilled and measured in this deposit. The extent of the deposit has been determined, but only the richest portions have been measured. There

are many nations who would be very glad to acquire the property rights of these deposits, but they are conserved to the Philippine Islands only by Executive Order No. 63 of 1914 and the imposition of an export tax of 2 pesos per ton. When the Surigao iron is mined at the present rate of taxation, the Government will realize about 1 peso per ton in taxes, which will amount to more than 500,-000,000 pesos. When these deposits are worked they will develop an immense industry in the Philippine Islands.

17. Other metallic mineral resources.— The production of gold is steadily increasing. In 1915 the output was worth over 2,600,000 pesos and, in my opinion, for 1916 it will be

increased by nearly 100 per cent.

The copper deposits of Mancayan, Mountain Province, have been worked for years and are the largest known in the Philippine Islands. Large amounts of high-grade ore have been shipped out, and 500,000 tons of 2.5 per cent ore are available and might be profitably worked. Copper deposits are found in many other provinces, but little is known about them.

Manganese occurs in Ilocos Norte, Pangasinan, Masbate, and a few other provinces. Three thousand tons worth about 10 pesos per ton were mined in Ilocos Norte this year and shipped to Japan.

Silver, lead, and zinc also occur in several places in the Philippine Islands and should

prove to be valuable.

18. Coal.—Almost every island in the Philippine Archipelago and a majority of the provinces are known to contain coal. The data which the Bureau of Science has accumulated concerning the quantity and quality of coal fields enables it to make intelligent estimates of the recoverable tonnages of diferent grades. In quality the coal ranges from black lignite to semianthracite. Conservative estimates show that there is "in sight" at least 3,500,000 tons of black lignite and 1,000,000 tons of subbituminous coal, while the probable tonnage is: black lignite, 26,500,000, subbituminous, 31,500,000; bituminous or semianthracite, 3,500,000. The possible tonnages are great. The largest annual (1909) production to date is 30,336 metric tons valued at 197,184 pesos. Owing chiefly to lack of development, the production has declined since 1909. There are several reasons which make the establishment of coal mining in the Philippine Islands difficult. Two of the greatest of these are: first, the coal is not of superior quality and is liable to spontaneous combustion both in the mine and in storage; secondly, the coal seams of the best coal are sometimes faulted, and there is discontinuity of the seams. Before the work of extensively mining the proper grades of Philippine coals, which are high in moisture and volatile combustible matter is undertaken again, it is desirable to carry on further work to ascertain beforehand the type of stationary and marine boiler furnaces most suited to such coals. With the present. high price of coal, any substitution might be marketable, but if freight rates become reduced, competition becomes keener, and I would recommend against the development of seams except those of the bituminous grade which can better stand against competition. By developing the better grade coals, there would be a wider immediate use and there would be less decline in the consumption if normal prices were restored. It is probable that Philippine coals were all laid down at approximately the same time, but faulting has resulted in an increased pressure which improved the quality of the coal by the removal of moisture and volatile combustible matter. In the mining of better grade coals there would be difficulties encountered on account of faults, but the product would be more marketable and the discontinuity is not so great but that the coal seams may be followed.

The 67-horsepower Otto suction producergas plant installed as an additional power unit in the power house of the Bureau of Science has been eminently satisfactory. The plant consists of a generator and a producergas engine with direct-coupled dynamo. The plant was operated exclusively and regularly on Batan coal for several months and used this fuel very successfully to furnish electric power. It will do the same with any other Philippine coal. The cost of producing electric power will vary according to the location of the power plant, availability of fuel, facilities of transportation, etc. With Philippine coal we were able to produce electric power by means of the producer-gas plant at 0.033 pesos per net kilowatt hour. This is cheaper than the Diesel crude oil engine and, besides, has the advantage of using a fuel of local production. In the Philippine Islands it is possible to mine coal cheaply, and from figures on file in this institution, it would seem that Philippine coal of good quality could be put on the market in Manila at a very much reduced price to the consumer.

19. Petroleum.—Petroleum is known to occur in Tayabas, Cebu, Iloilo, Cariz, and Leyte Provinces. Bondoc Peninsula in Tayabas Province has been studied in detail by the Bureau of Science and pronounced worthy of exploration by drilling. Samples analyzed show that the oil has a paraffin base and is practically free from sulphur. The Bondoc region seems sufficiently promising to warrant the Government spending funds for drilling in the most favorable localities on public lands, the location to be designated

by the Bureau of Science.

I have on file an estimate for drilling, an outlined plan for developing the oil fields of the southern part of Bondoc Peninsula, and several other documents, which bring the status of the Bondoc Peninsula petroleum resources to date. In 1914 I drafted an Act making appropriation for drilling wells in new districts for exploration purposes, which carried with it the sum of 200,000 pesos or so much thereof as may be necessary for the drilling by the Bureau of Public Works and the necessary work of the Bureau of Science connected with the exploration of petroleumbearing formations.

With the increasing number of oil-consuming engines and the increase in transportation charges, there is now even more reason for proving or disproving the existence of oil-bearing strata in the Philippine Islands.

20. Lime.—The status of lime manufacture in the Philippine Islands has always been far from satisfactory, although pure coralline and crystalline limestone suitable for the manufacture of lime occur throughout the Archipelago. The kilns which have been used are frequently simply holes in the ground. Lime is often made from sea shells which are poorly cleaned and consequently yield an impure product. The kilns are usually very wasteful in fuel and labor and make the cost of production of an inferior lime higher than it should be for a good one. The output is entirely unsuited for use in the sugar industry and for other chemical purposes and in the manufacture of lime products. The lime produced in the experimental kiln of the Bureau of Science is far superior to that heretofore obtained in commercial practice and is in every respect a firstclass article. There is no reason for the importation of lime into the Philippine Islands, and the increased production of sugar by modern methods has so augmented the demand, that there is no doubt that it would soon equal the output of large kilns. The lime of local manufacture is burned in the crudest manner and seldom contains more than 25 per cent of available lime. In spite of this it sells for about 30 pesos per ton. All of the lime which the experimental kiln of the Bureau of Science has produced has had a market value of 50 pesos per ton. If good

lime were available at a moderate price, there is no doubt of a demand. Probably at the outset the industry would thrive best if conducted in connection with a sugar central. This institution should have a corps of demonstrators for the introduction of new methods and of desirable modifications of existing methods in the Islands. A typical example of this need is found in the lime industry.

21. Hydrated lime.—Formerly in most countries lime was always sold as it came from the kiln as quick lime or calcium oxide. However, within the last few years slaked or hydrated lime has been placed on the world's market. This product is obtained by grinding quick lime, mixing it with the proper amount of water, and then rejecting the unhydrated portions. A number of hydrators for the manufacture of hydrated lime are in general use. These may be divided into two classes: the continuous hydrators and the batch hydrators. The first class is the more efficient, but requires a considerable investment of capital. It is a question which process would be best adapted to the Philippines.

Both hydrated and quick lime have certain advantages. The former is immediately available for use, is easily handled in any sort of container, and is not affected by moisture in the atmosphere. The latter is cheaper, requires lower transportation charges because of the absence of water, and is not so sensitive to the carbon dioxide in the air. Quick lime is used in the sugar industry, for lime which has absorbed carbon dioxide is absolutely useless for treating sugar juices. Considerable hydrated lime is at present made and sold in the Philippine Islands and should find extensive use for road building and water-proofing.

In connection with our experimental lime kiln, it is the intention of the Bureau of Science to investigate the manufacture of hydrated lime. Data on the method of hydration best suited to the local conditions, and on the relative suitability of the two kinds of lime under tropical conditions, should be of economic importance.

22. Lime products.—In connection with a lime kiln the operation of a sand-lime brick plant and of a bleaching powder plant shows

considerable promise.

Conditions are very favorable in the Philippines for the commercial manufactures of brick, building blocks, tiles, slabs, marbles, and ornamental stones from sand and lime. The cost of manufacturing and selling 9-inch bricks of the best quality is estimated not to exceed 13 pesos per 1,000, which, in comparison with the price of other building materials, offers considerable margin for profits. In Germany alone over three hundred sandlime brick factories are in constant operation. For many building purposes the use of sandlime brick is more satisfactory than concrete.

In connection with a lime kiln and a sandlime products plant a chlorination plant could probably be operated advantageously. The consumption of bleaching powder (calcium hypochlorite, CaOCl-2) in the city of Manila alone, a large part of which is used by the city of Manila for the treatment of the Manila water supply, amounts to 25,000 pesos per annum. I have not had time to investigate this industry thoroughly, but in my opinion it shows very great promise unless the industry would be unfavorably influenced by climatic conditions.

23. Vitrified and other clay products.— The Bureau of Science is at present conducting an investigation on the suitability of Philippine clays and shales for the manufacture of vitrified brick, roofing tile, drain tile, etc. The Philippines need a satisfactory paving material which can be produced locally. Imported road material cannot be used extensively because of the prohibitive freight rates. At present over 90 per cent of all streets in

Manila are paved with macadam. Employees of the Bureau of Science have scoured the country for suitable rock. Extensive test of all available material have been made and that now in use was adopted as the best on the recommendation of the Bureau of Science. Even were a first-class material available; a number of disadvantages are connected with macadam, among which may be mentioned its unsuitability for heavy traffic and the expense of upkeep. It seems probable that vitrified paving brick may be made from local raw materials, and if so the paving problem would be solved.

Recently much interest has been shown in a search for a cheap fire-proof material to replace nipa. It is possible that suitable roofing tile may be made for this purpose. The main difficulty is to make them sufficiently light for the ordinary supports.

Although building brick and tile are manufactured at a number of places in the Islands, in some cases the industry is carried on by very crude processes. As a result, the product is usually inferior in quality because of the improper moulding or burning. In many cases bricks of good quality could be made by changing the process. The establishment along Pasig River above Manila could make good brick by substituting the stiff mud for their soft mud process.

The Bureau of Science has collected considerable data on Philippine clay deposits, and both chemical and physical tests have been made on a number of the raw materials.

- 24. Silk.—The Burau of Science has raised silkworms for many years for the purpose of shipping eggs to those who might wish to engage in the business. This is an industry which supports thousands of people in several other countries. The care of the worms is easily learned. There is no heavy work connected with any part of the industry, and it may all be performed by women and girls. It is peculiarly suited to persons with small capital. I believe the reason that the silkworm industry has not been more developed in the Philippine Islands is because of the lack of means for reaching the people who would appreciate and profit by it. Demonstrators are needed who will introduce the work into provincial towns and barrios.
- 25. Fish.—This food which is next to agricultural products in importance in the Philippine Islands needs special attention. The value of the fish ponds in the vicinity of Manila is about 6,000,000 pesos. In Manila alone fresh fish to the value of 5,000 pesos is sold daily. The Bureau of Science has insufficient personnel to devote much time to the improvement of fish culture and to the determination of the possibilities of artificial propagation of food fishes, although its vast importance is realized. Only a very slight improvement in the value of 6,000,000 pesos means no small gain. Black bass and mosquito fish should be more widely distributed by the Government. Individuals will not do this on their own responsibility. Such fishes as anchovy, sardine, and herring abound and constitute a potential source of wealth. A great deal of study is necessary to determine their distribution and the best means of taking and protecting them. The manufacture of dried and smoked fish products is very important to the Philippine Islands, and there is urgent need of improving this industry. Salt is at hand in the Philippines for this purpose. There is much-needed demonstration work along all lines of fish culture and preservation of both fresh water and marine commercial products.
- 26. Window shells.—About 5,000,000 window shells are used each year in the building operations in the city of Manila, a large proportion of which come from the beds in Manila Bay. The demand for these shells in

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#### The Philippine Carnival

THE MARDI-GRAS OF THE ORIENT



INTRANCE TO CARNIVAL, 1913

Once each year the Philippines becomes the playground of the Far East.

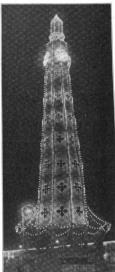
In 1908 the first Philippine Carnival was

In 1908 the first Philippine Carnival was held in Manila, and every year since then, conditions appeared last aummer such as to justify its postponement, a successor more elaborate and more attractive has been staged in Manila on historic Wallace Field, during the closing days of January or the beginning is at its best. The 1920, or Victory Carnival, will be the greatest event of its sort ever held anywhere in the Orient. The carnival city yearly raises itself almost overnight on the huge level field lying below the old Spanish walls, which form unique background.

A property of the control of the control



UDITORIUM WHERE TWO TROUSAND COUPLES DANCED NIGHTLY IN THE OPEN AIR, 1918 CARNIVAL



MERALCO TOWER, 1918 CARNIVAL

There are commercial and government exhibits in connection with the carnival, and on no other occasion is it possible to gain at once such a comprehensive idea of the production and development of resources of the archipelago as that which is offered the wieter of the consular class.

visitor at the carnival city.

In the evenings the carnival becomes the center of Philippine and Oriental social activity. A huge open-air auditorium serves for the elaborate nightly balls, and on its mammoth floor thousands of couples swing together to the strains of music furnished by the famous Constabulary and other military has been constabled and other military more constabled to the military of the famous Constabulary and other military more constabled to the military more constabled to the military of the famous Constabulary and the military more constabled to the military of the military more constabled to the military of the military of

world will one see an equally impressive cosmopolitan spectacle.

The Manila visitor who can plan his trip to arrive at the Pearl of the Orient for carnival time may well deem himself fortunate.

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#### The Philippine Embroidery Industry

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By Louise P. Brown

For many years the women of the Philippines have known how to embroider. It was originally taught in the convents by the sisters who came from Spain, Belgium, and France in the early days, and the native women, with their patience and dextrous fingers, became experts in their workmanship.

They embroidered intricate designs using a great variety of stitches, and also various patterns in the open-work known as "calado." In the early years, there was a trade sembroideries, selling their products only in the Philippine Islands. They would purchase cloth, draw a design by pencil and give it out to the women to embroider, afterwards peddling the product around the streets of get. They dealt mostly in embroidered blouses and dresses, the workmanship on which was excellent atthough often the de-

signs would be crude. If the design was good, it would be the material that was good, it would be the material that was wrong.

However, there was quite an amount of work completed and sold and a great many women in provinces close to Manila made it up into it. It was the combining of these three essentials, correct materials, dainty and

attractive designs and good workmanship, that started the embroidery industry as it stands to-day.

Somiderable quantities of these blouses and dresses had been purchased from the peddlers and shipped to the United States, but at that time embroidered blouses were not the style. There were heavy losses as a result, and it prejudiced the buyers in the States against Philippine embroideries to such an extent of the style of the

Lingerie being a mere staple article, not so apt to be affected by the change of styles,

was the opening wedge that brought the attention of the buyers in the United States
to the industry of the Islands. The French,
who had always made the fine hand-made
lingerie, had the reputation, the undisputed
style and the entire market. There was a
big constant demand for lingerie and a big
future for the Philippine industry, if the
future for the Philippine industry, if the
the French. Correct materials were selected,
correct shapes and styles made to fit the
American women, and designs adapted that
would please them. This was the type of
merchandise that was first put on the American market. It was greatly admired and
highly commenced on but there was great
delivered, if it was ordered,

The beginning of the industry was a real struggle. Not only was the market made and carefully developed in the United States, but in the Philippine Islands it was necessary to teach and train the natives to do the style of embroidery used on lingerie; to teach them to work in a systematic way and devpossible to manufacture lingerie in quanti-

ties.

The majority of the work is done in the homes, of the workers the same as in Europe. The work is prepared in a factory and then sent out to the country, embrodiered and returned to the factory, to be cut and made returned to the factory, to be cut and made Philippines scattered all over the islands who are embroidering. In some parts they are more proficient in some styles of work, while other localities do certain stitches better according to what has been customary among

As soon as the stores in the States realized that their orders on Philippine hand-made lingerie were delivered properly and the American women who bought it found that it was both correct in cut and suited to their its was both correct in cut and suited to their



PHILIPPINE HAND EMBROIDERIES ARE UNEXCELLED taste, the industry started to grow, with the result that the factories have been kept busy

keeping up with the increased demands.
The French have never used as fine a grade of material in their cheaper grade of lingerie as the manufacturers in the Philippines—also the workmanship is of a different style. The stitches on the Philippine product are fine, the property of the pr

previously was only seen in the most expensive

French models.

After the industry was started, the main attention was given to producing hand-made lingerie in quantities, and various factory methods were adapted to facilitate this. This eventually gave the American market a handmade garment at a very much less price than it had ever had before. It was only the wealthy class that could afford to wear the hand-made lingerie ten years ago, but this new Philippine lingerie was within the reach of many others of small means. This created an immense new buying public.

Figures from the Bureau of Customs show the growth in the export of embroidered hand-made lingerie from a small beginning in 1912 to a value of almost 4½ millions in

1918.

The war and the difficulty of getting the French hand-made lingerie, has hastened the recognition of the Philippine article, and the industry is permanently established. Embroidery can be counted as a permanent ex-

port of the Philippines.

The manufacturers are producing all articles of ladies and children's underwear and all qualities from the most inexpensive to the very elaborate with such wonderful work-very elaborate with such wonderful work-taught. They are also manufacturing infants' dresses out of the finest materials, children's frocks, handsomely embest materials, children's frocks, handsomely embedded to the control of the control o



A HOME INDUSTRY RAPIDLY DEVELOPING IN THE PHILIPPINES

# How to Ship to the Philippines

Being an open letter to the exporters of the United States By A. B. Cresop, General Manager of the Luzon Brokerage Co., Inc.

If this information is carefully impressed in your shipping department, there will result a great saving to yourself and your clients in the Philippine Islands, in addition to the satisfaction that will be experienced by your Philippine connection which is sure to secure for you additional business.

It is a positive fact that merchants of the Philippine Islands have been caused the loss of many thousands of dollars through either the lack of knowledge regarding simple requirements of the Philippine Government with reference to documents, or carelessness on the part of shippers in the United States.

Customs regulations, especially those pertaining to documents required by the customs authority, are simple and, if followed by the shipper, no inconvenience or loss would be sustained by the importer.

### DELIVERY OF MERCHANDISE

All merchandise imported into the Philippine Islands is delivered by the carrier to the Collector of Customs at the port of debarkation, and is delivered by the Collector of Customs to the lawful owner thereof, who must present, to establish this ownership, a properly indorsed "negotiable bill of lading" and the Collector of Customs is responsible under bond to make delivery to such lawful owner.

It is, therefore, most important that the importer have in his possession, upon arrival of the merchandise, a properly indorsed bill of lading. Not having this, in order to obtain possession of his goods, he is compelled, first, to state under oath that such bill of lading has not been received, and second, in lieu of it, file a Fidelity Bond for the value of the goods including freight and an additional 10 per cent.

These bonds must be furnished by a surety company recognized by the Philippine Government, or cash. Individual sureties may be accepted but, the formalities, under the laws of the Philippine Islands, make this almost impossible. With one exception, it is hardly necessary to state what constitutes a negotiable bill of lading, and that is: Importers doing business in the United States and in the Philippine Islands very often consign goods to order, being of the impression that their office in the Philippine Islands may sign for their United States office. This cannot be done unless a power of attorney is given for that specific purpose, a copy of which must be on file with the Collector of Customs. Bills of lading of this nature must be returned to the United States for their indorsement, thus necessitating a bond for its later production, properly indorsed.

It is very important that documents should accompany the shipments, either by the same steamer, or a steamer which preceeds the shipment. There is now being operated, established from the Pacific coast, a service from San Francisco to Manila, via Honolulu, direct, of twenty-three days. Undoubtedly, such a service will either leave Vancouver or Seattle. Obviously, documents which do not accompany these steamers will be from ten to fifteen days late, as the ordinary steamer is thirty days making the trip. In case of this kind, where the documents do not accompany the steamers, bonds will always be required at, not only, an additional cost to the importer but a considerable confusion in effecting delivery which must be made from the steamer's manifest which gives only the packages in general terms.

CLEARANCE AND DELIVERY OF IMPORTED MERCHANDISE

In order to obtain delivery of imported,

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merchandise into the Philippine Islands, there must be filed with the Collector of Customs an entry, in duplicate, which must be accompanied with the bill of lading and two copies of invoices.

The United States Tariff Law pertaining to the Philippine Islands prescribes, under section 16, the following:

### **INVOICES**

"Sec. 16. That all invoices of imported articles, goods, wares, or merchandise shall state the true value thereof in the currency of the place or country from whence imported, or, if purchased, in the currency actually paid therefor, shall contain a correct description of such articles, goods, wares, or merchandise, with true numbers, weights, and quantities, in the tariff terms of this act, and shall be made in quadruplicate and signed by the owner or shipper, if the merchandise has been actually purchased, or by the manufacturer or owner thereof, if the same has been procured otherwise than by purchase, or by the duly authorized agent of such purchaser, manufacturer, or owner.

These invoices may be in four forms:

(1) For dutiable merchandise whether coming from the United States or foreign ports, where the value is more than one hundred dollars (\$100.00). U. S. currency, the invoice must be presented to a United States consul, vice-consul, collector of customs, or commercial agent of the United States, of the consul district, in which the merchandise was manufactured, purchased or shipped from.

(2) If the merchandise is of the growth, product, or manufacture of the United States as provided for in section 12 of the United States Tariff Law pertaining to the Philippine Islands:

"Sec. 12. That all articles, except rice, the growth, product, or manufacture of the United States and its possessions to which the customs tariff in force in the United States is applied and upon which no drawback of customs duties has been allowed therein going into the Philippine Islands shall hereafter be admitted therein free of customs duty when the same are shipped directly from the country of origin to the country of destination: provided, that direct shipment shall include shipment in bond through foreign territory contiguous to the United States. Said articles shall be as originally packed without having been opened or in any manner changed in condition: provided, however, that in having been opened or in any manner changed such articles shall become unpacked while en route by accident, wreck, or other casualty, or so damaged as to necessitate their repacking, the same shall be admitted free of duty upon satisfactory proof that the unpacking occurred through accident, or necessity, and that the merchandise involved is the identical merchandise originally shipped from the United States, or its possessions as hereinbefore provided, and that its condition has not been changed except for such damage as may have been sustained."

A commercial invoice having a certificate of origin made a part thereof and signed, shall be presented as prescribed by Customs Administrative Circular No. 626.

"PAR. III. The original and duplicate invoices for merchandise the growth, product or manufacture of the United States, shall have the following certificate printed, written, typewritten, or stamped thereon:

"I hereby certify that the above-described articles are of the growth, product, or manu-

facture of the United States, or its possessions, and that no drawback of import duties has been or will be claimed thereon, and that this invoice is true and correct in all particulars."

"This certificate shall be signed on both original and duplicate invoices by the manufacturer, seller, or consignor of the merchandise, or by a duly authorized agent of such seller, manufacturer, or consignor, and both invoices (except for shipments by post) shall be mailed to the consignee of the merchandise for filing with the customs entry pertaining to the importation."

(3) Importation of foreign merchandise the value of which is less than one hundred dollars (\$100.00), a commercial invoice without the consular certificate is sufficient.

(4) Importation from the United States where the value is less than ten dollars (\$10.00) and the Collector of Customs is satisfied that the merchandise referred to is subject to "Free Entry", under section 12, the certificate referred to before is not required.

Many exporters in the United States seem to be of the impression that foreign goods, which have been imported into the United States and duty paid upon their entry, are "free of duty" upon importation into the Philippine Islands. This is not the case. All foreign merchandise imported into the Philippine Islands is subject to duty regardless of the fact that it may have paid duty upon entry into the United States.

One of the greatest sources of loss of the Philippine merchants on foreign merchandise imported from the United States is from the fact that importers in the United States will ship foreign merchandise together with domestic merchandise in one invoice and fail to make notation of this on their invoices, and in the majority of cases, even certify that the entire invoice is of American origin, or manufacture. In cases of this kind, the importer is subjected to a fine of from one to five times the duty which, in almost every case, at least the minimum, is imposed. In addition to this loss caused to the importer, by oversight or carelessness on the part of the shipper, the shipper is naturally placed under suspicion and all importations coming from him are most carefully scrutinized.

It should not be necessary to call the shippers' attention to the necessity of proper packing. It is, however, a fact that shippers in the United States ship merchandise in the poorest containers of any shipper in the world. They do not seem to realize that this merchandise must travel many thousands of miles and in many cases be handled a number of times. Their shipping department is in the habit of making shipments to local points with one or two handlings, which does not require heavy packing. It is strongly recommended that, in all shipments where the contents are of any appreciable value, an export packing be used. In other words, a packing which is especially heavy for foreign shipments.

Another very important matter is that of marking. Marks should be plain in big letters. If stencils are used, they should be placed at least on two sides of a package. Ninety eight per cent of unclaimed merchandise which is sold in the Philippine Islands annually, and which runs into thousands of dollars, is because the marks have been rubbed off, or so mutilated that they can not be read, or that the merchandise has been packed insufficiently and cannot be identified when it arrives in the Philippine Islands.

If the requirements referred to herein are carefully followed, it will certainly result in a greater volume of business for those shippers. Nothing will increase business more than the complete satisfaction of clients and the correctness of documents, and properly packed merchandise, is probably the cause of more business than any other factor. When competition is keen, prices are about the same from one importer as another and service alone will increase the business.

UNIVERSITY OF CALIFORNIA

## THE COMMERCE OF THE PHILIPPINE ISLANDS A SURVEY OF NINETEEN YEARS OF PROGRESS

By Hiram Merriman, Secretary, The Manila Merchants' Association

The most prosperous period of the Philippine Islands under the Spanish administration was from 1888 to 1892. During those years the foreign trade of the Islands averaged slightly less than \$\mathbb{P}80,000,000 a year. In 1918 the trade amounted to \$\mathbb{P}467-000,000, or a six-fold increase. During nineteen years of American leadership trade has certainly "followed the flag". The United States has naturally profited the most as a result of the increased trade. During the last years of Spanish rule the United States supplied but 3% of the imports of the Islands, slightly over **\P1**,000,000. During 1918 imports from the United States amounted to **P117,000,000**, or 60% of the total importation into the Islands.

As soon as order had been obtained in the principal ports after American occupation they were open to commerce, and in 1901 the first Philippine tariff was put into effect, it being the same as the Spanish tariff with a few modifications. Both imports and exports jumped immediately. In 1901 external trade amounted to \$\mathbb{P}20,000,000 more than the best period of Spanish times. In 1902 the trade was \$\mathbb{P}107,000,000 and in 1903 \$\mathbb{P}124,000,000.

From 1900 to 1909, trade increased steadily. doubling in the ten-year period. The movement of trade was quickened from 1909 to 1913, due in large measure to the tariff law of 1909, which called for free admission of Philippine products with certain limitations; most of these limitations were removed in 1913. The two years, immediately preceding the war, 1913 and 1914, covered a period of depression to some extent in the United States, and in a larger measure in the Islands, due to poor crops and apprehensions on the part of business men as to the future status of the Islands. This condition in the summer of 1914 was approaching a critical stage, when the European War broke out, and for a time appeals were even made to have Congress provide a subsidy of P10,000,000 to tide the Islands over the war time depression.

It was not until April 1915 that a change was noticed. At that time the increased demand for Philippine products was beginning to be felt, and a limited amount of shipping space could be secured.

The sensational advance in the export trade of the Islands beginning in the summer of 1915 was anticipated by very few, and thus, the Islands have not been able to reap the full benefit of the results which might have been obtained by foresight and increased production. 1917 and 1918 may be summed up in one word—prosperity. In some cases large profits have been taken advantage of and foundations have been laid for future development. In some lines the expansion has been too great and a period of reaction may be looked forward to.

# GROWTH OF IMPORT TRADE WITH THE UNITED STATES

The percentage of United States in Philippine imports increased four-fold from 1897 to 1901, amounting to over \$\mathbb{P}7,000,000. This, however, was negligible compared with the enormous total of the last few years. The largest proportion of this early commerce was for the needs of American civil population, in fact the most important item was that of malted liquors. In the years immediately following, imports increased slowly, coincident with the growing Amer-

ican population. All the imported staples used by the natives, canned goods, cotton goods, etc., were still in the hands of British and other foreign houses, which maintained branches throughout the Islands and with whom the American firms with limited capital and little knowledge of local conditions could not compete. By 1906 only 16% of the imports were in American hands.

During this year, however, the United States Congress passed a tariff law which provided for reciprocal free trade between the United States and the Philippine Islands. This was the signal for a revival in Philippine trade on the part of the United States exporters and in 1910 30%, and in 1911 40%of the imports came from the United States. In 1909 imports from the United States were **P**12,000,000; in 1912, three years later, they were **P**48,000,000. 1913 was a period of depression in the Islands and imports from the United States dropped slightly (11%). In 1914 came the open of the world war, a consequent scarcity of ships and a falling off in both imports and exports was noticeable. Imports from the United States, however, increased and have continued to do so with heightened momentum. In 1918 importation from the United States was **P**117,649,222.

## FUTURE TRADE WITH THE U. S.

The Mother Country now has a monopoly in both the export and import trade of the Islands and foreign competition is steadily getting smaller.

The population of the Islands is now over 10,000,000. There are few local manufactures; many of the necessities and most of the luxuries must be obtained from abroad. Thus a large potential market is lying ready for tapping by the American manufacturer. This market can of course be developed only by increasing the foreign purchasing power of the people, which is measured in terms of exports. The problem of Philippine trade, then, is not merely of sending agents to sell American articles, but consists as well of encouraging Philippine production by tariff inducements favorable to Philippine articles of commerce; by encouraging capital to be invested in the Islands; and in the establishing of cheap and reliable freight service for transportation of these articles to the United. States.

## HEMP

Hemp is the main stay of Philippine trade. Abaca (Manila hemp) comprises onehalf of the exports of the Philippine Islands. The prosperity of the country largely depends on it. Hence it is gratifying to note that since American occupation the exports have increased from 70,000 tons to 170,000 tons, the export value a little more than doubling during that time. The United States, even before 1899, was the largest purchaser of the higher grades, but a large part went thru English hands. By 1918, however, most of American supply was shipped direct, the United States taking \$\mathbb{P}75,000,000 out of a total value of \$\mathbb{P}\$115,000,000. In spite of temporary changes in the market, abaca, being a Philippine monopoly, will always remain a staple article and in constant demand, which will increase as the world's need for rope products increases. Sisal fiber, coming mostly from Yucatan, can be termed a competitor of abaca only in the lower grades, and then only in the factor of price, and when not enough abaca fiber can be procured.

## COPRA AND COCONUT OIL

During Spanish times copra, the dried meat of the coconut, was exported in fair quantities to France and used in soap making. The annual export was from 20,000 to 30,-000 tons yearly. During the latter years of Spanish occupation renewed interest was taken in coconut cultivation, and numerous large plantations were started. Since 1900 the annual production in the Islands has increased four-fold, but only within the last few years has any appreciable portion been shipped to the United States. Just before the war the United States purchased about 15% of the annual export, but during 1917 two-thirds of the total, and in 1918 practically all, went to the United States.

During the last four years, however, copra exports have decreased, due to establishing mills in the Islands for extracting the oil. As far back as 1885 primitive mills were in operation but they could do little in competition with factories of France and Germany, which controlled the soap trade of the world. Early trade reports of the United States Bureau of Commerce speak of possibilities of local extraction, but coconut oil manufacture in the Islands did not assume large proportions until 1916, when 15,000 tons were exported, valued at \$\mathbb{P}7,000,000. In 1917 45,000 tons were exported, valued at **P**23,000,000 and in 1918, 115,000 ts. valued at **P**63,000,000. All of these went to the U.S.A.

There are now over forty companies in the Islands organized for the manufacture of coconut oil, with around 200 expellers for expressing the oil. The increased plantings of trees in the last few years give rise to an estimate of 200,000 to 250,000 tons a year as the export in the very near future. During the war, in addition to its uses as soap, etc., coconut oil has been used to make glycerine, a constituent of high explosives.

There are those who think that now the war is ended the demand for coconut oil will slacken, but its increased use for edible purposes as vegetable butter for cooking and eating open up a market for it which is capable of indefinite expansion.

## SUGAR

The sugar industry in the Islands is of long standing and during the latter years of Spanish administration exports reached 280,-000 tons per annum, which amount had only been exceeded once since that time.

Most of this sugar comes from the Islands of Negros and until very recently was of low grade, being exported to China and Japan ports. Beginning with 1914, however, most of the sugar has gone to the United States. The establishment of sugar centrals for the production of sugar suitable for the American market has paved a way for the revival of the sugar industry and large amounts of capital are coming in from Hawaii and the United States for building new centrals.

## CIGARS AND TOBACCO

The Cagayan valley has long been the center of the Philippine tobacco industry, and in Spanish times the tobacco trade was in the hands of the Government monopoly. European countries, principally Spain and Germany purchased the tobacco leaf, few cigars being exported. During the last 20 years several campaigns have been conducted for the purpose of introducing Philippine cigars in the American market, but until 1917 very little progress was made. In 1917 284,000,000 were exported and in 1918 359,000,000 of which 80% went to the U.S.A.

The growth has, of course, been a result of the war and if Philippine cigars are to retain their hold in the American market an extensive and persevering campaign must be carried out both in regard to introducing the cigars to consumers and in the improvement of quality. The Bureau of Internal Revenue is doing good work in both of these lines and a rigid inspection is made of all cigars exported from the Philippines.

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### The Walls of Old Manila

Among the many structural antiquities that abound in Manila the most interesting is, beyond question, the ancient system of fortifications that surround the spot where stood the original Malay city of "Manila." The the original Malay city of "Manila." The existing walls, bastions, redoubts and curtains whose proportions and magnitude are not realized by the casual observer, are construct-ed of Guadalupe stone and offer an excellent illustration of the designs and defensive methods of the times in which they were built. On the arrival of the early Spaniards in Manila in 1570 under Martin de Goiti, there existed on or about the site of what is now Fort Santiago a Filipino fortress surrounded rort santiago a Filipino fortress surrounded by a pallisade and armed with twelve pieces of Moro artillery manned by Moro subjects of Rajah Lacandola, under the direction of a Portuguese adventurer. The landing of the expedition having been resisted, the Spaniards



BASTIONS THE INTERIOR OF WHICH HAS BEEN MADE INTO AN AQUARIUM



BAGUMBAYAN GATE TO WALLED CITY

41 guns, 29 of bronze and 12 iron the former, ranging from two to twenty-five pounders and the latter from three to thirty-two pounders. The garrison was ridiculously small compared with the armament and consisted of one Spanish company of infantry composed of one commissioned and eight non-commissioned commissioned and eight non-commissioned officers and 60 enlisted men. The 41 guns were manned by one gunner and twelve artillerymen. There was also one company of native troops, Pampangans, 90 men in all, who performed the service of laborers. While the number of men in the garrison was ridiculously small, the pay awarded them for their services was much more so, for the same their services was much more so, for the same report says that the monthly allowance to the warden was \$66.60; to the licutenant of the warden was \$66.60; to the licutenant of the the ensign, \$4; the sergeant, \$3; the gunner, \$4; the captain of the Pampangans, \$6; his ensign, \$2.50; bis sergeant, \$2.50; while the Spanish enlisted men received \$2 and the Pampangans \$1.25, all these amounts being in Mexican currency. Starting from the Fortress of Santiago the

wall facing the bay is of thin light construc-

The Spaniards went into the fight with the battle cry of "Santiago" and gave that name to the captured works as soon as they were in possession of them and from that time the place became the starting point of the system of fortifications that stand today a monument to the engineering skill of those times.

The nature of the construction was deter-The nature of the construction was occur-mined by the almost successful attempt made by the Chinese corsair Limahong to capture the city in November 1574, Sioco, the Japan-seconmander of the attacking expedition to commander of the attacking expedition to be commander of the attacking expedition becomes a commander of the attacking expedition pullisade in Deaking through the woodle pullisade in June 1997, and the construction of a permanent stone fortification to struction of a permanent stone fortification to struction of a permanent stone fortification to guard against future attacks and uprisings.

Permanent construction was commenced in 1590 under Perez Gomez Dasmariñas and ontinued until 1872, the principal part of the the work done by Juan de Silva in 1609, Juan Niño de Tabora in 1626 and Diego Fajado in 1644. In 1729 the walls were restored and sixteen years later were beingtened. sixteen years later were heightened.

Fort Santiago was originally a castellated structure without towers and nearly triangular, but underwent material changes from guar, but underwent material change time to time as occasion demanded. An interesting official report dated 1739 shows that in that year Fort Santiago was defended with



DADIAN GATE

UNIVERSITY OF CALIFORNIA

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tion and merely a retaining wall for the terrace of earth that forms the main protection. The moat formerly running from the river round the city wall was constructed after 1739 as an additional protection. At the end of Diego Bastion breached by the British in their attack on the city in 1762. From that point the wall continues more solid in construction to the San Andres Bastion and then follows round the ancient city to the Pasig river where it completes a chain of seven bastions, and five redoubts, known as the Aduana. San Gabriel. San Lorenzo, San Andres, San Diego, and Plano bastions; and the Parian, Recoletos, Real, San Pedro and San Francisco redoubts.

The wall was pierced in seven places with gateways three on the river side and four on the land side. Only one of the former, the Isabela II gate remains, the others having been demolished in 1902-1903 to make way for public improvements. The Parian gate, built in 1782, the Real gate in 1780, the Santa Lucia gate in 1781 and the Postigo probably in 1609 still remain.

Entrance to the walled city was, until 1852, possible only through these gates, each of which was provided with a drawbridge which was raised at 11 p. m. and lowered the follow-

ing morning at 4 a. m.
Up to 1880 the mural armament consisted of 370 cannons. In 1898 on the surrender of the city to the American forces of occupation 149 more or less modern guns were taken over 28 of them rifled, 24 being field guns and 20 mortars and the remainder smooth bored

The plans of the reconstructed fortifications were prepared by Father Sedano, S. I., and the early work was carried on under his direction. What these original plans were has never been determined as, in one of the many disastrous fires that swept the city in in those early days of almost entirely nipa construction, all the government archives were lost. Only twice or three times has any portion of the original construction been un earthed. In the early part of 1902 Colonel Greenough of the 7th Artillery, at that time commandant of Fort Santiago, reported the discovery of the socalled secret chambers and passages under the fortress. Bubonic plague was rife at the time, and the colonel, with the end in view of preventing its entry into the precincts of the fort, set about policing up the entire place. Every nook and corner received due attention. In one corner, in the apex of of the wall fronting the Pasig river, during the process of cleaning up, a large chamber was found, approximately 50 yards square. A spiral stairway leading down to below the vel of the water was also discovered. followed to its end it was found that it went below the level of the river into a large tunnel terminating in a doorway. This was probably an exit from the fortress built prior to the time when the earthquake of 1645 materially changed the course of the river, destroying this part of the defensive works.

Another part of a defensive underground passage way leading from the fortress to the San Diego Bastion facing the Luneta was discovered during an excavation in connection with the reconstruction of the Cuartel de España which stood on the site of the ancient Jesuit church. The workmen came across a remarkably well constructed archway that formed the roof of a tunnel about twelve feet wide that is believed to have passed under the old San Agustin Church, the Jesuit Church and out toward the polverin that formerly stood near the present Luneta police station on Camp Wallace.

These discoveries led to fanciful stories of mysterious underground dungeons and torture chambers, etc., and even skeletons and rusted implements of inquisitorial punishments were invented.

#### The Renaissance of the Manila Cigar Ru Colin M. Hoskins

Formerly Chief, Division of Tobacco Industry, Bureau of Internal Rese

There is probably no product of the Philippine Islands so well known to Americans as the Manila cigar. Tobacco has likewise been a subject of great interest to the local Government since the introduction of the weed into these Islands during the last quarter of the sixtenth century by the Spanish missionaries coming here from Mexico. For an entire century the tobacco industry of the Philippine Islands was a government monopoly, the state having control of the production, manufacture and sale of this product. In the field, there was a chief appraiser, styled "interventor," who had a praiser, styled "interventor," who had a force of subordinates known as "alumnos aforadores." The chief appraiser set the and also determined the date of planting and the number of subsequent seed beds.
The instructions of the Government went into considerable detail, going so far as to prescribe the number of times the land should be plowed, the dates when the plowing should take place, and the number of plants which should be set out per unit of land. This supervision was extended to the harvesting and curing of the leaf and its classification into the several grades. The regulations were enforced by severe penalties.

As was to be expected, under such close supervision, the reputation of Philippine tobacco and Manila cigars secured an enviable reputation in the markets of the world, where their mildness and choice aroma were deeply appreciated. By 1881, however, the system of Government control had become so objectionable to the planters that local uprisings were of constant occurrence. Consequently, in that year, altho the monopoly was the Government's biggest source of revenue, it was completely abolished.

It had been anticipated that a withdrawal of official supervision would improve the quality of Philippine tobacco, by encouraging competition. The contrary was the result.

The planters, freed from the former odious supervision, went to the opposite extreme. Being no longer forced to work and having very simple needs, they grew shiftless and im-provident. Owing to the large European demand for cheap tobacco, planters could dispose of their crop, even tho poor in quality. Philippine tobacco continued on its down-ward course until 1909, when the Payneward course until 1909, when the rayne-Aldrich Tariff Act was approved, admitting Philippine cigars into the United States, free of duty. This date signalized a new epoch in the Philippine tobacco industry. It was anticipated that, with the tariff barrier removed, the entire industry would receive an impetus which would re-establish it in the world's markets. Thru the discussions on the Tariff Bill, the Manila cigar had received free advertising throughout the length and breadth of the United States. The American public was really keen to try out this cigar whose free entry into the United States was so bitterly fought by the tobacco trust. The dealers and consumers alike, expected a cigar equal to the Havana cigar at a ridiculously low price. Manila exporters made plans low price. Manila exporters made plans for getting rich over-night. When the Tar-iff Act was finally approved, all available cigars were snapped up, new factories were opened, old ones were enlarged, and an unholy rush began to turn out cigars.

At first it looked as the the renaissance of

the Manila cigar was at hand, but very soon disquieting reports came from the United States. With no organization of the industry, with unrestricted competition, the exporters shipped enormous quantities of cigars to the United States which were unfit for human consumption. Other cigars of good quality were quickly destroyed by the tobacco beetle. American jobbers and deaers who had handled Manila cigars suffered heavy losses. The consumers were disappointed in the product. As a result, within two



ALL MANILA CIGARS ARE MADE BY HAND, A FACT WHICH MAKES THEIR WORKMANSHIP SECOND TO NONE. "LOSE UP VIEW OF THREE CIGAR-MAKERS WHO ARE DOING THEIR BIT TO KEEP MANILA CIGARS POPULAR

years the Manila cigar was utterly discredited. The exports fell off steadily for a number of years, until the end of 1914, when only 59,000,000 cigars were sent to the United States

At that time the Government be came gen-uinely alarmed. The Governor-General sent the Collector of Internal Revenue to the United States to investigate the causes for united states to investigate the causes for the slump in the trade and as a result of his report and recommendations, the Legislature, in February 1916, passed Act No. 2613, the Tobacco Inspection Law which aimed to remedy the conditions brought about by the discrediting of the Manila cigar in the United States

It has been a long and trying job to re-establish the name of the Manila cigar in the American market, but after 3 years of vigo-rous campaigning, the Manila cigar industry has won back the place which it held many years ago. It was in 1914, when the Governyears ago. It was in 1914, when the overliment realized its duty to promote the industry which marked the true renaissance of the Manila cigar. The Government stands behind the Manila cigar and guarantees its quality. The tobacco planters are instructed in proper cultural methods and an experiment station has been established under the ment station has been established under the joint auspices of the Bureau of Agriculture and the College of Agriculture in the Gagayan Valley. All leaf tobacco is classified and graded before it leaves the province of ori-gin. Factories operate under sanitary regulations which make them second to none in the world in cleanliness. No cigar may be shipped from the Philippine Islands to the United States until it has been inspected by the Government agents and certified as standard If the cigars so certified, deteriorate within 72 days after arrival in the United States, the Government backs up its guarantee by paying the cost of re-conditioning cigars, or if unmarketable, returning them to the Philip-pine Islands.

The Manila cigar today holds a high place in the estimation of the American smoker. The mildness of the Manila product is its most noticeable virtue. The inveterate smok-



HYGIENIC CONDITIONS FOR THE CIGAR-MAKERS GO HAND IN HAND WITH SCRUPULOUS CLEANLINESS IN MANILA CIGAR FACTORIES. VIEW OF THE INTERIOR OF A WELL LIGHTED AND VENTILATED FACTORY WHERE CIGARS ARE MADE FOR AMERICAN SMOKERS

er appreciates it because he can smoke many Manila cigars without the satiation which would follow smoking an equal number of other cigars. No longer is the Manila article a minor export product. As compared with the 59,000,000 cigars which were shipwith the 39,000,000 cigars which were shipped in 1914, there were shipped in 1918 to the United States, 265,234,000 Manila cigars. During the last 5 years the growth, while phenominal, has been so steady, from month to month, quarter to quarter, year to year, that the growers and manufacturers alike feel confident of la permanently increasing market in the United States. As the American smoker is learning to discriminate between the good Manila cigars and the really high grade Manila cigars, the proportion demanded of the more expensive sizes is increasing. The elimination of the Customs duty has given to the American smoker, a cigar comparable with the best imported smoke, at a price not exceeding the best domestic smoke. It is this fact upon which the Philippine tobacco industry relies for the permanence of its American market.

#### Industrial Possibilities

(Continued from page 70)

other countries for making windows, lamp shades, and screens is steadily growing. The heavy demand for these shells may rapidly deplete the beds. The attempt has been made to introduce this mollusk at other places, and the Bureau of Science has planted some in a suitable place near Malabon. This work needs more care and extension.

27. Sponges.-Some Philippine sponges are of fine quality, but their reputation on the market may easily be injured by the shipping of poorly-prepared or improperly-sorted and packed goods. The Government should be able to direct spongers in their work, to assist them in marketing their sponges to the best advantage, and to prevent the marketing of inferior products.

28. Button shells.-The shells used for button making are collected from widely scattered localities. It is possible that these species of mollusks could be propagated in selected and convenient water areas. Experiments along this line are needed.

29. Pearls and pearl shells.-Several hundred thousands pesos worth of pearl shells are exported annually from the Philippine

Very promising methods for the artificial production of natural pearls have been de-veloped in Japan. This requires water with a summer temperature and is profitable in Japan though carried on only during a part of the year. In the Philippine Islands the of the year. In the Philippine Islands the industry should be still more profitable, for the pearl production could be carried on during the whole year. This, in connection with the large size of the Philippine pearloyster shell, would mean a great advantage to the production of cultural pearls in Philippine waters.



ONE OF THE MANY THOUSAND GIRLS ENGAGED IN STRIPPING PHILIPPINE TOBACCO LEAF FOR CIGARS



#### The Lumber Industry of the Philippine Islands

By Arthur F. Fischer, Director of Forestry

The history of the lumber industry of the Philippine Islands during the past twenty years, if written, would show what this ever pioneering industry had to contend withgoing into new, practically unpopulated and virgin country and developing it. Heartbreaking experiences in the first years were met with especially due to distance from the United States as a source of supplies, inadequate transportation to out-of-the-way places, and chaotic markets locally, coupled with innumerable other vicissitudes. Having surmounted these difficulties, the industry, as it exists at present, has gained the first place among typical American achievements in the past few years, especially since 1916, is well deserved.

The lumber industry, ranking among the leading industries of the Islands at the present time, has many additional achievements to its credit other than attaining its own present importance. In Mindanao, it has been one of the greatest pacifying factors among generally turbulent people, by giving them permanent employment and the means for securing a continuous and better food supply, changing in many instances a migratory and shiftless people to a settled, contented and fairly efficient working community. Its civilizing influence has been exceeding greats It is no uncommon sight in the outlying mill. to see former members of the semi-nomadic, non-christian population using modern ma-

chinery and becoming good citizens.

About P12,000,000 (\$6,000,000 gold) is invested in the more modern portion of the industry, while several millions more, of which no accurate data is available, are invested, particularly in animals, by the thousands of small licensees in their logging operations.

In spite of a large decrease in exports, owing to the demand on shipping for other products and the heavy freight rates, almost all the mills have continued to operate

the seven larger mills, they produced 62,000-000 board feet in 1918 as against 56,000,000 board feet in 1917. The total production of mill sawn lumber was 75,000,000 board feet as compared to 60,000,000 board feet in 1917. These figures are only for mills operating on their own license areas and do not include the lumber output of the mills perating in various portions of the Islands, which buy their logs from logging licensees If all the production of licensees were figured, the total annual production of the Philippine Islands in 1918 would approximate 120,000,000 board feet. Even with this production, the demand could not be supplied and unheard of prices are prevailing for manufactured lumber and will continue to prevail. In addition to the native lumber produced

n the past year there was imported 6,308,-700 board feet, practically all from the United States, of which a portion was re-exported to India and the Dutch East Indies

The local demand for lumber in the future will increase beyond all precedent, as the activity of other industries, particularly the production of copra and the establishment of coconut oil factories, has brought great prosperity to many of the small landholders and the tendency of these small landholders is to build wooden houses instead of the poor class of mixed material houses that has been the chief form of housing for the common people of the Islands. Public works projected for the ensuing year are the most pretentious of any heretofore undertaken in the history of the Islands; the local demand alone should be well over 150,000,000 board feet for the ensuing year.

#### FOREIGN MARKETS

The shortage in bottoms and increasing freight rates seriously affected the ship-ments of lumber to foreign markets, with



a consequent reduction in the amounts of lumber shipped to China and the United States, but this condition did not affect the lumbermen to any great extent as they were unable to supply the local demand. Nevertheless, efforts were made to get some export out in order to keep at least some Philppine lumber before the foreign buying

public.		
Domestic bleached sulphite,		
delivered\$5.75	to	\$0.50
	to	\$7.50
Domestic unbleached sulphite,		
delivered	to	\$4.00
Foreign unbleached sulphite on		
N. Y	to	\$4.00
Foreign easy bleaching\$4.25	to	\$4.50
Mitscherlich unbleached sulphite \$4.00	to	\$4.25
Domestic soda fiber bleached,		
delivered \$4.25		
Scandinavian kraft pulp\$4.50	to	\$5.00

During the two years previous to 1916 the prices for the bleached pulps ranged from 2.10

prices for the bleached pulps ranged from 2.10 to 3.05 dollars in January, 1914, to from 2.25 to 4.10 dollars in December, 1915. In view of the present high price and shortage of raw materials, it seems a favorable time to emphasize the fact that we have here in the Philippines an unlimited supply of material fit for the manufacture of strong white paper pulp. For several years the Bureau of Science has been investigating the suitability of bamboo, cogon grass, abaca or hemp, and various palm fibers for paper pulp. With due regard to local conditions, the data collected show that even under orthe data collected show that even under ordinary conditions an industry of great economic value can be developed. Careful surveys of some of the available bamboo fields have been made. Sufficient data with regard to the cost of the raw material, the quantity of bamboo available, and the cost of manufacture of pulp are given in Bureau of Science publications, showing that the bamboo soda-pulp industry can be developed for a possible export trade, in direct com-petition with chemical wood pulp at present

The Bureau of Science has estimated the cost of manufacture of pulp from caña bojo, dividing such cost into the following items: (1) labor, (2) fuel power, etc., (3) chemicals (1) aoor, (2) tuel power, etc., (3) chemicals and supplies, (4) repairs, renewals, depreciation, (5) taxes, insurance, interest. All of these items have been discussed in deal in the Philippine Journal of Science. Three





RED LAUAN AND TANGUILE FOREST 50,000 BOARD FEET PER ACRE

to four hundred thousand pesos should be sufficient to build, equip, and operate a sodapulp mill of 20 tons' daily capacity. Such a plant built in a modern manner and efficiently operated will produce unbleached air-dried bamboo fiber at a maximum cost of 50 pesos per ton f. o. b. Manila.

The opportunities for a very large export trade are exceedingly good, especially when shipping conditions and freight become more normal. The United States is at present the best market for the highest grades of lumber, and China will take practically all the common grades. A single order for common lumber for China during the past year called for 5,000,000 board feet per month, but could not be filled for reasons already stated. Japan, New Zealand, Australia, the Dutch East Indies, Federated Malay States and India, have repeatedly inquired as to placing orders and inquiries have already been recrived from Europe for Philippine hardwoods.

#### The amount of lumber and timber exported in 1918 as compared with 1917 and 1916

		1918.	1918.		
	Cubic meters.	Board Feet.	Value.	Cubic meters.	
To United States: Timber Lumber	31 6,999	13,144 2,967,576	7 1,015 376,153	12,488	
Total	7,030	2,980,720	377,168	12,488	
To Hongkong: TimberLumber	169 3,858	71,656 1,635,792	10,978 80,066	1,166 8,310	
Total	4,027	1,707,448	91,044	9,476	
To China: Timber. Lumber	5,477	2,322,248	166,084	223 6,453	
Total	5,477	2,322,248	166,084	6,676	
To Japan: Timber Lumber	10	4,240	1,453	26 23	
Total	. 10	4,240	1,453	45	
To Australasia: Lumber	. 13	5,512	426	51	
To Guam: Lumber	. 11	4,664	810		
Grand Total	. 16,568	7,024,832	636,985	28,74	

	1917. Board feet.	Value	Cubic meters.	1916. Board feet.	Value.
	5,294,912	P483,215	14,880	6,309,120	P 659,186
Total	5,294,912	483,215	14,880	6,309,120	659,186
	494,384 3,523,440	72,842 \$ 215,645	9,255	175,112 3,924,120	6,4743 92,949
Total	4,017,824	288,487	9,668	4,099,232	99,423
	94,552 2,736,072	8,730 121,009	190 15,270	560 6,474,480	9.484 254,828
Total	2,830,624	129,739	15,460	6555,040	264,312
	11,024 9,752	1,501 1,995			
Total	20,776	3,496			
Total	22,050	1,646			
Total	12 186 186	906 583	40.008	16 963 392	1 022 921





The principal woods exported have been tangile, red lauans and the various lighter colored lauans. The best grades have been used for high class interior trim in houses. furniture and cabinet work, especially in piano and phonograph cases, while, soon after war was declared, tangile was tested for aeroplane propeller blades and accepted by the Navy Department.

The Philippine Islands contain approximately 40,000 square miles of virgin forests with stands of from 15,000 to 35,000 board feet per acre: stands of from 45,000 to 65,000 board feet are not infrequent at elevations between 1,000 to 1,800 feet above sea level, About 20,000 square miles in addition are covered with forest, but are classed by the Bureau of Forestry as non-commercial, as the stand does not average over 2,000 to 3,000 board feet per acre. Over 99% of all the timber is the property of the Government and is administered by the Bueau of Forestry under a system of licenses granted for from 1 to 20 years duration, with renewal privileges. The long-term license agreements (or concessions, as they are popularly called), are only granted under certain conditions which specify the amount of capital to be invested, the minimum cut during several succeeding years, together with certain requirements as to logging and manufacturing

equipment, etc. Stumpage is paid for as cut at the following rates:

							7 1.00
First group -						. !	10.0
Second group							6.0
Third group -	-	-		-			4.0
Fourth group			:				2.0

The bulk of the cut of lumber at the sawmills (about 90 per cent, is of the third and fourth group. It is readily seen that stumpage is comparatively cheap. A big advantage to Philippine lumbermen is that stumpage does not have to be paid for until cut. thus obviating a big investment in stumpage before manufacturing can proceed. Long term license agreements generally cover an area of from 10 to 300 square miles, generally on tide water

Philippine forests contain wood from the lightest daluro (air roots of Pagatpat) used as cord substitute, to one of the heaviest woods in the world, mancono (80 pounds per cubic feet), and from pines similar to the yellow pine of the Southern States to the finest cabinet woods. The forests are the greatest single natural resource in the control of the Government and this vast supply of useful woods, when known to the people of the United States, should produce a steady demand, as the Philippine Islands the only place in the tropical world where the lumber industry has been developed to a stage such that it can supply a steady and considerable demand

In conjunction with the extraction of lumber the so-called minor forest products, such as gum copal, rattan, dyewood and dyebarks, tanning extracts, gutta-percha, Manila elemi, wood oils soap barks, fiber plants, pili nuts, nuts, beeswax, medicinal plants and orchids, attain quite sizable proportions in not only local consumption but export as well, as can be seen from the following tables of export:

1010

	.,	1711	1,10
Beeswax	P 15,733	P 17,301	P 6,545
Elemi	9,828	29,525	34,939
Furniture	13,141	37,422	31,444
Gum copal	138,821	188,940	211,593
Gutta percha	1,807	11,101	14,630
Pili nuts	588	1.058	14,434
Rubber crude	75,210	80,179	30,005
Sapan wood.	62,501	65,863	72,840
Orchids	3,667	11.437	12.015
Rattan	56,204	45,988	68,472
Cinnamon	-	404	1,691
Ilangilang	22,999	56,587	
Candle nut	116,988	333	
Total	517.487	546.138	498 608



(Continued from page 66) is nearly always a breeze. It is said of Manila that at any time of the day or night, if one can get between a door and a window. comfort can be found, and this is nearly correct.

There is much data to substantiate the claim that the climate of the Philippines has claim that the climate of the Philippines has certain peculiar results upon the general tone of the system and the predisposition to certain diseases. Two things may ac-count for all of these phenomena. The "tropical diseases," so called, are the result of the presence of disease germs peculiar to the Tropics, and therefore infecting residents, but wholly independent of the climate itself. Immunity from these germs is being constantly increased and the climate cleared of the charges of producing the diseases.

The other and more serious charge is that long residence in the Islands causes a general loss of tone and letting down of the system that results in weakened ambition, faulty memory, and general sluggishness. So far as this is true, it is not due to any poison in the climate, but do the lack of a hardenson in the climate, but do the lack of a hardening cold season, when nature toughens up
the entire system to withstand the increased
exposure. It is also true that under the very
favorable conditions all the year around, children grow faster and mature younger than in countries where four or five months of the year are so rigorous that the latent resources of the child are kept busy preserving life and health without doing much growing. Obviously, this feature of the case has both good and bad results.

It is emphatically true that most of this "untoning" effect of the Tropics may be counteracted by the maintenance of systematic and vigorous exercise. Where it is so comfortable to sit still, the tendency is to court the favorite book and shady nook in the leisure hours, when the far greater need is for a swim, a walk, or a game of golf or tennis. As a matter of common observa-tion, people who lead active lives enjoy good health, and have no complaints to make

concerning the climate. Anybody, except an outdoor day laborer Anybody, except an outcoor day labour, can so arrange his program as to keep well and be comfortable in the Philippines. That is, he may keep as well and be as comfortable as in any other country inhabited by the men who come to the Tropics. Since the outs of the dietetic and climatic conditions. they have enjoyed as good health in the Philippines as in the United States,

Death is almost an unknown visitor among the Americans in the Islands. Part of this is due to the excellent precautions taken against such diseases as are liable to prevail, mainly owing to the fact that none but young and vigorous men come here. But allowing for all things, the fact remains that the aver-age health of the Americans in the Islands

age means is good.
A distinguished visitor to Manila remarked that of all tropical countries none afforded an atmosphere like that of the Philippines.
"This air," he said, "has about it a cares," a soothing quality, that comforts and rests one after the day's work."

This same quality has been noticed by many persons, and could easily be lauded as some magic quality that lent a superhu-man power to the climate. The facts are, however, that this genuine charm is due to just the right proportions of moisture and temperature in air that is free from im purities or extremes of stagnation or high winds. These qualities would produce a charm anywhere at any time, but the trou-ble is that just these ingredients are not elsewhere to be found, and so far no one has been able to artificially manufacture them. If the visitor wants to enjoy them, he will have to come to Manila to find them.



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GOVERNOR-GENERAL FRANCIS BURTON HARRISON, MAJOR GENERAL, PHILIPPINE GUARD.



VICE-COMERNOR CHARLES E VEATER SECRETARY OF PUBLIC INSTRUCTION



HON. SERGIO OSMEÑA, SPEAKER OF THE HOUSE OF REPRESENTATIVES.



HON. MANUEL L. QUEZON, PRESIDENT OF THE PHILIPPINE SENATE.



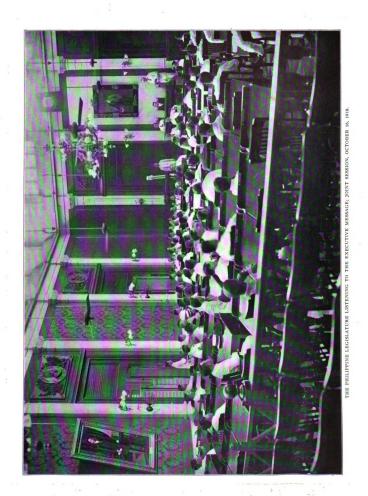
HON. TEODORO R. YANGCO, PHILIPPINES RESIDENT COMMISSIONER AT WASHINGTON



GENERAL EMILIO AGUINALDO, VICE-PRESIDENT OF RIZAL REFINING CO. AND PHILIPPINE REFINING CO.



GENERAL VENANCIO CONCEPCION, PRESIDENT OF THE PHILIPPINE NATIONAL BANK





CABINET OFFICERS AND UNDER-SECRETARIES OF EXECUTIVE DEPARTMENTS.





SUPREME COURT OF THE PHILIPPINE ISLANDS.

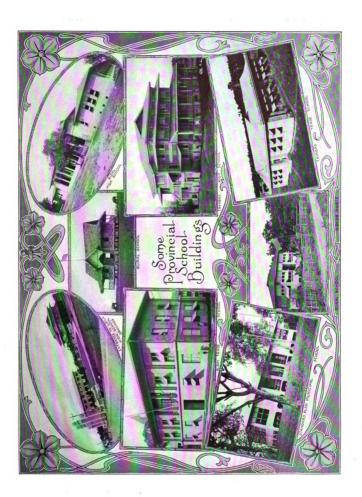


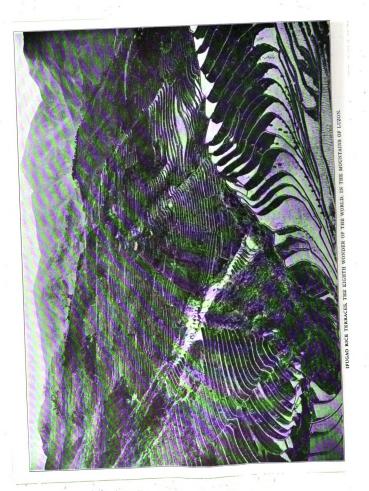
MRS. SOFIA DE VEYRA, WIFE OF COMMISSIONER DE VEYRA, A LEADER AMONG FILIPINO WOMEN.

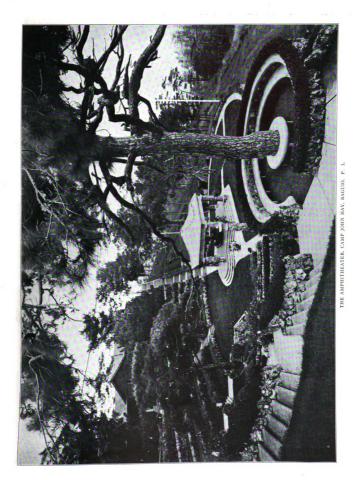


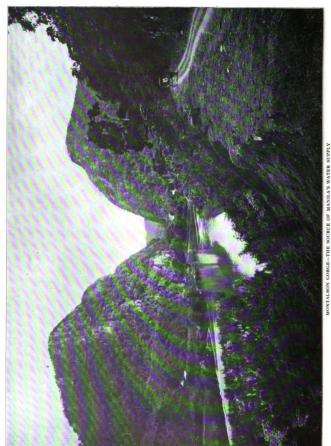
MOUNT MAYON, THE MOST PERFECT VOLCANIC CONE IN THE WORLD, ALBAY PROVINCE.

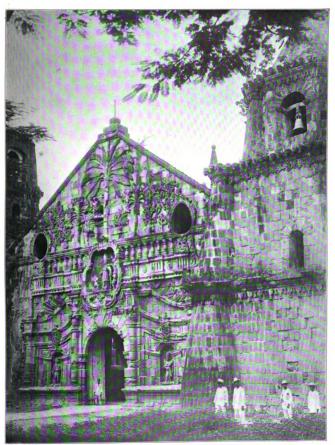




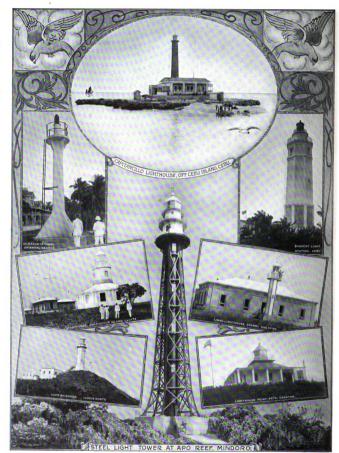




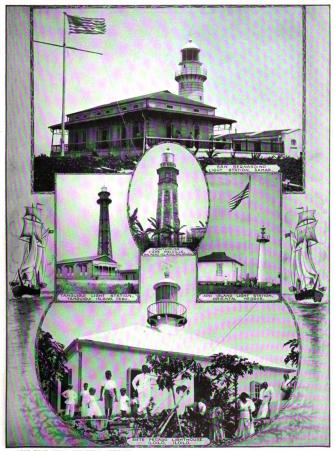




MIAGAO CHURCH, ILOILO-CARVED FACADE DATES TO 1774

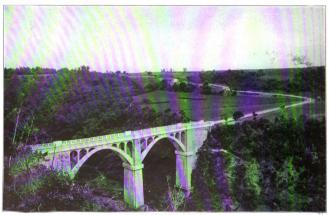


"LIGHTS THAT NEVER FAIL"\_A FEW OF THE 200



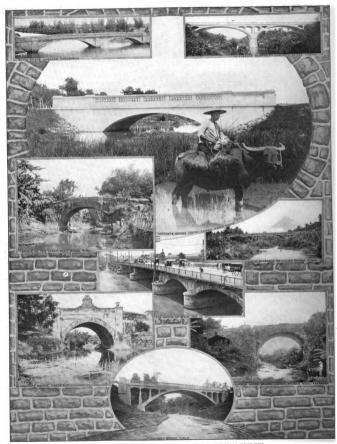
BEACONS THAT GUIDE PHILIPPINE SHIPPING

GILBERT STEEL BRIDGE, LAOAG, ILOCOS NORTE

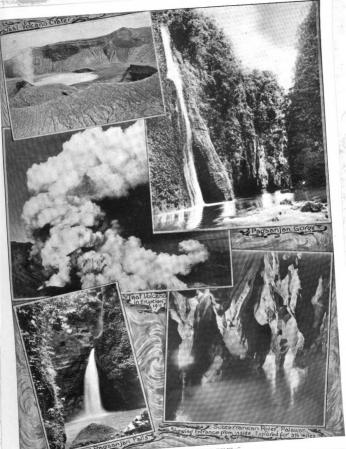


SABANG BRIDGE, BATANGAS

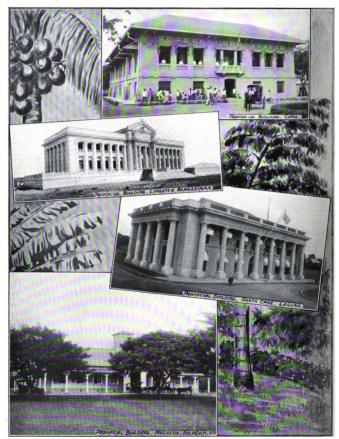
"TYPICALLY AND BEAUTIFULLY AMERICAN" LUPIT BRIDGE, OCCIDENTAL NEC



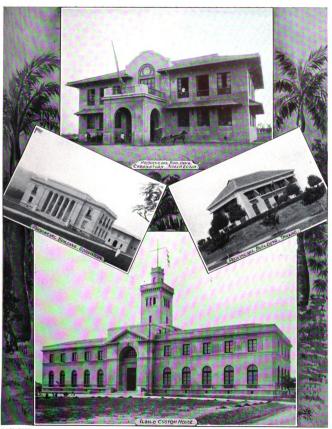
"TWO GENERATIONS"-TYPICAL SPANISH AND AMERICAN BRIDGES



"THOSE CHARMS THAT NATURE HOLDS-



TYPICAL GOVERNMENT BUILDINGS



IN VARIOUS PARTS OF THE ISLANDS



SOME INTERESTING PHILIPPINE PLANTS

1. THE SO CALLED DUDIAN RHODODENDRON 2. DENDROBRUM SCHUTZEI 3. GIGANTIC FERN 4. TREE FERNS 5. FISH
TAIL PALM 6. A PARASITIC FLOWER ON ROOTS OF VINES—THIS GENUS PRODUCES THE LARGEST FLOWERS IN THE
PLANT KINGDOM 7. PITCHER PLANT, FOUND ON ALL HIGH MOUNTAINS IN THE PHILIPPINES 8. TRAVELERS
TREE 9. BUTTERFLY ORCHID 10. DENDROBROW LINN 11. TERRESTRALO RCHID



BUILDINGS CONSTRUCTED BY DR. H. D. KNEEDLER, A PIONEER IN MANILA REAL ESTATE DEVELOPMENT



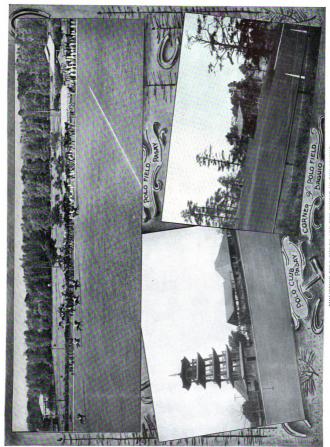


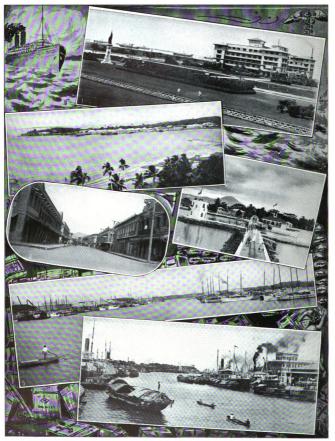
VIEW OF THE OLD MOAT, MANILA, 1906



TEW FROM SAME POINT AS ABOVE. NOW A PART OF THE MUNICIPAL GOLF COURSE







1. MANILA HOTEL 2. HARBOR VIEW, TACLOBAN, LEYTE 3. MAIN STREET, CEBU, CEBU 4. THE PIER AT JOLO 5. THE WATERFRONT, ILOILO 6. SHIPPING IN THE PASIG RIVER, MANILA



BAGUIO, THE FAMOUS MOUNTAIN RESORT OF THE PHILIPPINES

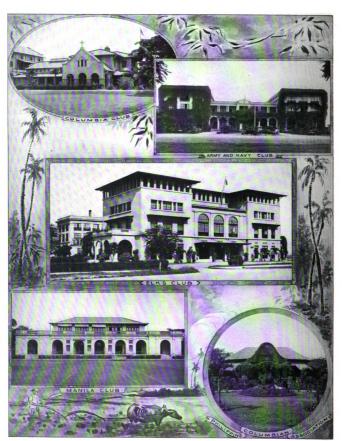




OFFICERS AND DIRECTORS MANILA MERCHANT'S ASSOCIATION

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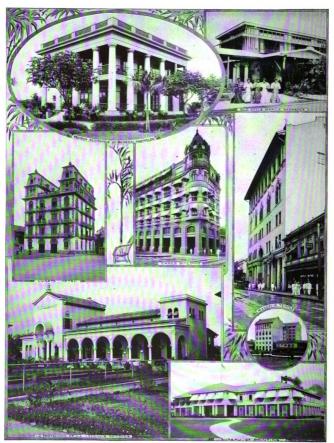
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A FEW OF THE REASONS WHY LIFE IN MANILA



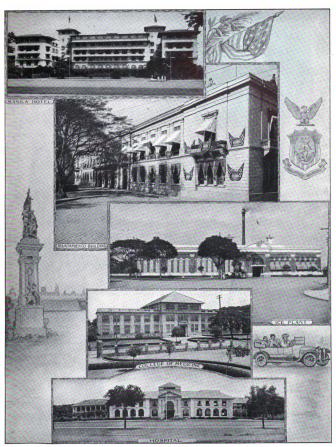
IS MORE ATTRACTIVE THAN IN OTHER ORIENTAL CITIES.



MANUA BOASTS HUNDREDS OF BRAUTIEU

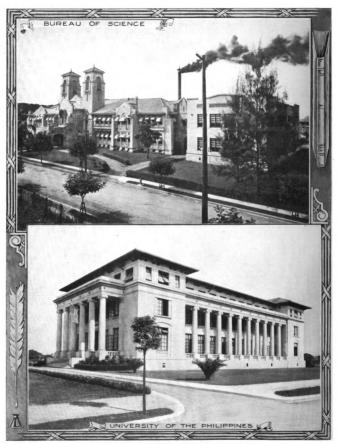
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HOMES AND FINE PUBLIC BUILDINGS.





TWO BEAUTIFUL SAMPLES OF MODERN ARCHITECTURAL BEAUTY

# The Philippines and their Part in the Great War

Based on Official Data Furnished by the Philippine Council of National Defense



MRS. A. S. CROSSFIELD, FIRST PRESIDENT OF THE PHIL-IPPINE CHAPTER OF THE AMERICAN RED CROSS

AR removed from the seat of war, affected very little in a direct way by the hostilities in Europe, the Philippine Islandshap played a part in aiding the cause of the United States and the nations associated with her in the struggle against Germany, that has been nothing short of remarkable.

When the United States government severed diplomatic relations with the imperial German Empire as a result of the resumption of ruthless submarine warfare, a fair part of the interned fleet of German vessels lay in Manila Bay. As was the case in American ports, the German authorities, realizing that a declaration of war was imminent, issued orders which resulted in the immediate destruction, or attempted destruction, of the complicated driving machinery aboard the ships. It was to prevent greater damage to the boats than had been effected during the first night, when their crews received orders from the German consulate, that the Philippine Government took its first step toward active participation in the war.

Through the cooperation of the civil authorities and of the navy stationed in Manila bay, these ships were actually taken over and placed in the custody of American naval and Philippine constabulary guards weeks between the constabulary guards gu

masters in Manila Bay in order to escape capture at the hands of the British and Japanese squadrons.

As soon as war had been declared the desire of the Philippine government to cooperrate to the fullest extent with the United States in its prosecution was made manifest in many ways. But, as is usually the case following moments of the greatest stress and excitement, it soon became apparent that the greatest results could only be achieved through a definite co-ordination of effort.

The adoption of the council of National Defense idea, as it had been developed by the federal government and various states of the union, offered the most logical solution for local difficulties.

With the full support of the government at Washington, Governor General Francis Burton Harrison, in September 1918, took formal steps to orgaine the Philippine Council of National Defense, under the general supervision of which the war activities of the Philippine government have since been, and, until the signature of the peace treaty, will be conducted.

While the council is today filling a most important place in the patriotic life of the entire Philippine community, much was accomplished through the agency of patriotic Filipino leaders, American citizens, the Philippines chapter of the American Red Gross, organizations existing within the allied Gross, organizations existing within the allied Philippine towns, and through the initiative of the Philippine Legislature before the council became officially existant.



BRIGADIER GENERAL RALPH W. JONES, ADJUTANT GENERAL AND ORGANIZER OF THE PHILIPPINE GUARD DIVISION

THE PHILIPPINE GUARD

Almost immediately following the declaration of war the proposal to organize



AMERICAN AND FILIPING WOMEN SELLING LIBERTY BONDS. FOURTH LIBERTY LOAN



MISS TRINIDAD FERNANDEZ WHO WAS PROMINENT IN ALL WAR WORK CAMPAIGNS

and equip a Philippine Guard Division of 25,000 men which could be offered to President Wilson and the American people for active war service, was put forward by Senate President Manuel L. Queson. The third of the Company of the Proposed Service and Service

Despite continued uncertainty as to the manner in which the federal government would make use of the troops offered, there was no hesitation in perfecting plans for the completion of the organization. In the summer of 1917, an officers' training school was opened in Manila, and through the cooperation of the United States Army detoperation of the United States Army detoperate an efficient nucleus around which a complete division could later be built. Further delays in ascertaining the wishes of Washington with regard to the disposition of the guard and with regard to its federalization were encountered in 1918, due largely to the fact that cable communication was difficult, tedious and unsatifactory, and also to the fact that the government of the United States during those problem of placing the men already in American cantonments on the battel line in France.

Enthusiasm was not lost, however, and by the latter part of the summer a second Officers' Training School, of sufficient capacity to provide officers for a full division, was organized.

A three months' course of training for these officers was followed by assurances from Washington that federalization of the division, which in the meantime had been recruited to maintain its authorized strength, would be authorized immediately. Nevertheless, it was not until November first that the division was mobilized at the big cantonment erected on the outskirts of Manila, and where the division officers were undergoing training in the interim. It was not until November 19, 1918, that authority for federalization was received. By this time the armistice had been signed, but the division officials not only did not slacken their efforts to make the opportunity afforded by Washington count for the most during the months of federal training, but steps were at once taken to secure from the Philippine legislature the necessary authorities for maintaining the division at full strength on an insular basis for sixty days after the month's federal service was ended.

As a result, while the Philippine Islands, due to conditions over which neither its government nor its people could exercise control, was not able to place an official oeganization in France, February 19, 1919, saw the mustering out of service of a division of well trained Filipino soldiers, each of them whose service was prompted by deep loyalty to the United States and a firm conviction in the righteousness of the allied

#### RED CROSS

On April 6, 1917, the Red Cross organization in the Philippine, Islands consisted of what was known as the Philippine Board of the American Red Cross, and aside from the supervision of relief work in connection with



MRS. TERESA VAMENTA. PROMINENT MEMBER
OF WOMAN'S CLUB AND DAMAS DE FILIPINAS

public disasters of a local or Oriental nature its activities were decidedly limited. It immediately became apparent that the American Red Cross was to play a part in of the armies in the Philippines. To cooperate most effectively in this great work the Philippine organization was notified to order the American Red Cross. Red Cross membership campaigns and subscription campaigns, simultaneous with those held in the United States, were launched in the Philippine organization was a subscription campaigns, simultaneous with those held in the United States, were launched in the Philippine organization of the American Red Cross and States, were launched in the Philippine of the Philippine of

Funds were not alone secured through the membership and subscription campaigns. The 1918 Philippine Carnival turned over its profits to the Red Cross, various local control of the Red Cross, various local of Ellas, staged benefits which netted many thousands of posos to the chapters' treasury. As in the United States the sporting fraternity proved an important factor in aiding the Red Cross Work. Boxing, racing, tributors in the Philippine Islands.

Some comprehension of the work which the Philippines Chapter has done during the periods of America's participation in the war may be got from the fact that up to December 31, 1918, shipments of Red Cross supplies alone from the Philippine Islands



A COMPANY OF AMERICAN RED CROSS WORKERS, MANILA

totalled, in round numbers, 359,000 surgical redesing, 93,000 abominal bandages: 62,000 triangulars, 26,000 Tris; and 47,000 of soft waring articles as bed shirts, pajamas, sweaters, cases, nightgowns, handkerchiefs, to paraling leggins, bed socks, comfort bags, operating leggins, bed socks, comfort bags, other socks, children's socks, shawls, bolress, children's socks, shawls, bolress, children's socks, shawls, bolress, children's socks, shawls, bolress, children's socks, shawls, borless, children's socks, common description, shawls s

Work is now going on organizing the Philippine National Red Cross organization under F. H. Garrett, who has been named general manager with headquarters in the Masonic Temple.

### OTHER RELIEF WORK

In addition to the relief work of the Philippines chapters of the American Red Cross

had made plans for their use, and, in so far as possible, it was the intention to man them with Filipino crews.

In a way that was more effective, the Philippines were called upon to contribute to the salvation of Russia, as a matter of vital importance to the allied cause. To accomplish this the Philippine Department of the United States Army was practically stripped of American troops, and the men from Fort William McKinley, just outside of Manila, are still on duty in Siberia.

#### LIBERTY LOANS

Four Liberty Loans have been floated in the Philippines, and we are now on the eve of the campaign for the fifth.

To the four Liberty Loans the Philippines have subscribed approximately \$20,000,000. In the first loan no allotment was made for the Islands but over \$500,000 was subscribed. In the second loan the Islands were alloted \$1,000,000, a total which was over subscribed by 75 per cent.



A GROUP OF "FOUR MINUTE MEN," MANILA. OVER TWO THOUSAND OF THESE MEN RENDERED EFFECTIVE SERVICE IN WAR WORK CAMPAIGNS THROUGHOUT THE ISLANDS

the Philippines played a large part both before and after the entrance of the United States in the war, in contribution of funds for Belgium, France, and British war relief work.

Through the cooperation of private citizens and the Philippine tobacco industry literally millions of cigarettes and hundreds of thousands of Philippine cigars were shipped direct to the American troops in France.

At the same time, the Islands contributed liberally to the "ball and bat fund," organized by Clarke Griffith, and in return that organization tendered to the Philippine Government baseball equipment sufficient to meet the needs of the entire Philippine Guard Division.

### OTHER MILITARY ACTIVITIES

In addition to the offer of the Philippine Guard Division, the Philippine government supported its pledge of loyalty to the United States by the glift of a torpedo boat destroyer, and a submarine, both of which have been constructed in American ship-yards at the expense of the Philippine treasury. Although these craft were not completed in time to take an active part in the naval sampaign of the United States, the navy In the third loan the treasury department of Washington announced that the subscription quota for the Philippines would



MRS. ROSARIO DELGADO, VICE-PRESIDENT, PHILIPPINE CHAPTER, AMERICAN RED CROSS

be \$3,000,000. This announcement, for the first time, came sufficiently far in advance of the opening of the drive to permit the perfection of an efficient organization to handle the campaign both in Manila and throughout the provinces. The government and the Philippine Month of the properties of the preparations to make this campaign an overwhelmine success. Provincial and municipal



HOME WORKERS. MEMBERS OF THE FILIPINO CHAPTER OF THE AMERICAN RED CROSS, MANILA

government officials throughout the Islands were enlisted as heads of provincial and municipal or local committees working in direct cooperation with the central campaign organization in Manila.

The American, Filipinos, British, French, Japanese, Spanish and Chinese communities in Manila volunteered their own organizations under the supervision of the central committee, and it was through their efforts that the total of individual subscriptions. On designated as an official holiday throughout the United States, was also observed in the Philippines.

Enthusiasm was not allowed to wane at any time during the campaign and at the end of the drive, it was announced that the Philippine quota had been over-subscribed in the amount of \$1,625,000. The total amount of the subscriptions in the third loan was \$4,625,000, of which amount \$2,098,350 was subscribed in the provinces.

For over-subscribing its quota by more than 50 percent the Philippines was awarded an honor flag, which has since become a treasured possession of the Philippine community as a whole.



Y. M. C. A. HUT AT CAMP TOMAS CLAUDIO DURING MOBILIZATION OF THE PHILIPPINE GUARD DIVISION



SECTION OF CAMP CLAUDIO DURING MOBILIZATION OF THE PHILIPPINE GUARD DIVISION



THE DEFENDER'S CLUB, FORMERLY THE GERMAN CLUB. NOW LEASED BY THE Y. M. C. A. AND CONDUCTED AS A CLUB FOR ENLISTED MEN. SUPPORTED BY SUBSCRIPTIONS FROM MANILA MERCHANTS

With the organization of the Council of National Defense completed, the machinery for handling the Fourth Libery Loan campaign proved even more effective than that which had been created for the third Loan

Special committees representing the Council of National Defense and the individual organization of the special loan committee were organized to cover literally every section of the Islands, every element of the Philippine community and all of its varied activities, A considerable amount of liactivities. A considerable amount of li-terature was prepared and sent broadcast throughout the archipelago. The Four Minute Men organization, under the direc-tion of the Council of National Defense was thoroughly perfected for the opening of the drive. Speakers in English, Spanish and various native dialects were commissioned in various native dialects were commissioned in every municipality and barrio of the Islands, and accomplished wonders in carrying an educational campaign and a political appeal to the farthermost districts of the Archipelago. The quota alloted to the Philippines for the Fourth Liberty Loan was \$6,000,000, just double the amount assigned to the Islands in the third loan. The campaign in Manila opened with a grand community rally. And on the first evening of the drive the people Manila alone had subscribed \$4,500,000. The maximum subscription on the first day was \$500,000 and the minimum subscrip-tion recorded at the rally was \$25,000. This beginning assured a glorious finish for the drive. October 12th was observed as "Liberty Day", and on the afternoon of that day the greatest procession that the Philippines has ever seen passed through the streets of Manila. Patriotic demonstrations were also the order of the day in all of the larger towns throughout the provinces. Five days later the campaign closed, the Islands having subscribed \$12,123,500 or more than double the amount of their quota. Of this amount approximately \$7,500,000 was subscribed in Manila, the remainder coming from the provinces where 95 per cent of the individuals subscribing for bonds were Filipinos.

# FOOD PRODUCTION AND CONSERVATION

The entry of the United States in the world-war early in 1917 and the vigorous action taken by the administration throughout the United States to save up\_everything





A GROUP OF OFFICERS, PHILIPPINE GUARD DIVISION

that could help to win the war, especially the food supply, had its counterpart in the Philippine Islands at practically the same time. Realizing that the best way to help the United States in the struggle would be to economize and increase the Islands food matter in hand with the result that the scattered efforts for a great many years, especially by the Bureau of Agriculture, to increase the agricultural production of the Islands took a more vigorous turn. On recommendation of the Department of Agriculture and Natural Resources, the Governor General named a committee composed of Resources, the Director of Education, the Director of Science, the Director of Health, and the Insular Purchasing Agent. This committee was charged with the duty of studying "the question of production, conservation and supply of foodstuffs in the

One of the first steps in the campaign was the institution of crop seed selection especially of rice, the government undertaking this work by establishing seed selection centers in the provinces. But probably the most far reaching attempt to increase the production of food in the Islands was the development of home gardening, in which the public schools have taken a very prominent part.

A home garden contest for every province was organized and prizes offered. One thousand pesos was set aside for the province winning first place; five hundred pesos for the province winning second place, five hundred pesos for the municipality, cownship or district winning first place in the province; pality winning second place in the province. These prizes served as a direct incentive to the people to take up home gardening.

The immediate result in this direction was at once made apparent by the increase in the total number of home gardens from some 20,000 to 67,289 according to the report of the department of agriculture for the year 1918

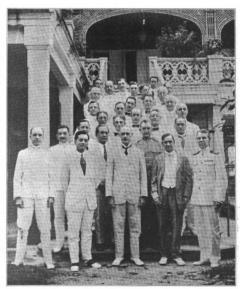
# COUNCIL OF NATIONAL DEFENSE

As has been stated above, the Council of National Defence, since its organization, has been intimately connected with every phase of the war work and reconstruction activities in the Islands.

The great achievement in the Liberty Loan campaigns was undoubtedly the creation of the Four-Minute Men organization, but its greatest and continuing influence is at present being made felt through the medium of the daily news service which reaches every part of the Archipelago.

It was early realized that in order to secure a maximum of cooperation in the patriotic

work which the Philippines had projected it would be necessary to make the masses of the Filipino people understand that the issues which were being decided upon the battlefields of Europe were issues in which they themselves were vitally concerned. Almost immediately after the organization of the council a daily mail and telegraphic service reaching every post-office and tele-graph office in the Islands was inaugurated. Liberty Loan propaganda, publicity work for the Red Cross membership drive during the Christmas week of 1918, and information on the United War Relief Campaign were thus distributed throughout the islands. So valuable has this service proved that the daily telegraphic bulletins are being continued indefinitely.



THE PHILIPPINE COUNCIL OF NATIONAL DEFENCE, ORGANIZED AT THE INSTANCE OF THE SECRETARY OF WAR FOR THE PURPOSE OF COORDINATING AND SUPERVISING WAR WORK IN THE ISLANDS

HON. FARNIS BURTON HARRISON, CHARMANY, MINMERES GIN. H. A. GREINE, U.S.A.; CAST. E. SENPRON, U.S.A.,
HON. CHARLES E. PATER, RON. SEGEO OMENNA, HON. ARAVUEL L. QUEEDO, NOS. RAFACIELE, BOO.
VICENTE MORESTE, BOO. VICENTE MORESTE, HON. QUINTIS PAREDES, HON. FARNY W. CARPENTER, GIN. B. W.
JONES, N.G.; GIN. KAJARLE CLARM, F.C.; GIN. VENANISON CONCEPCION, MADO WILLIAM M. CONDON, B., U.S.A.
CAST. HIGGI STRACION, U.S.A.; CAST. S. M. SHRARER, DR. GERODE W. WEIGHT, MR. C. R. DUTFY, MR. J. E.
BELLANTY, M. P. LUUTES REEK MR. T., FOULTY, MR. P. SENENCO A INDIGADO, MR. DE MOR DE ALTON MR. CLASSON
QUARTY, MR. M. L. STEWART, MR. ALLAN B. WERKHOLDER, DR. J. D. LONG, MR. B. A. TIGH, MR. E. E. ELSER,
MR. H. B. TOOR, MR. B. A. TIGH, MR. E. E. ELSER,
MR. H. B. TOOR



AMERICAN AND FILIPINO WOMEN IN THE FOURTH LIBERTY LOAN PARADE, MANILA

#### PUBLIC SCHOOLS

In Red Cross work, Liberty Loan campaigns and food production campaigns the results accomplished through the medium of the public schools of the Philippine Islands cannot be over-estimated. Working on the theory that thousands of homes which it would be difficult to reach in any other way could be appealed to directly through the children of the family attending the public schools, Dr. W. W. Marquardt, Director of the Bureau of Education, placed at the disposal of the Council of National Defense, Red Cross officials, and the loan campaign committees the facilities which the school system offered for propaganda work in all parts of the islands.

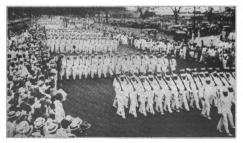
While most noticeable results were obtained in the organization of the Junior Red Cross and in the impetus given the food production and conservation campaign through school and home gardens and special courses in the domestic science classes, there can be no question that the success of the Liberty Loan drives in the provinces was due in a very great, if not the greatest, measure to the excellent work of the school teachers and their pupils.

## CHEMICAL WARFARE SERVICE

When it became necessary for the American Army authorities to develop gas masks which would proved effective in protecting the American troops against the poisonous gas used by the German, experiments revealed the fact that charcoal made from the shells of the coconut possessed absorbent qualities which made it the best material for use. Representatives of the federal chemical warfare service made America's needs known in the Philippines. And once again the Islands made immediate response. Tons of coconut shells were converted into charcoal, turned over to the military authorities and shipped to the United States for use in the manufacture of gas masks.



ONE OF THE THOUSANDS OF HOME GARDENS TENDED BY BOY MEMBERS OF AGRICULTURAL CLUBS



It has been impossible in an article of this length to attempt any detailed account of the war efforts of the Philippine Islands, but if the reader is able to realize that in spite of numerous difficulties and the great distance which separates the Islands from the United States and the seat of war, the Philippines and their people put forth a united and decided effort to demonstrate their loyalty to the United States, and the cause of the allies, its purpose will have been accomplished.

SOME OF THE FIVE THOUSAND FILIPING STUDENTS WHO PARTICIPATED IN THE FOURTH LIBERTY LOAN



# A Golfer in the Philippines

By Tom Nicoll



NINTH GREEN, MANTLA MUNICIPAL COURSE

When, a few years ago, it suddenly dawned on folks that Manila has a really fine golfing climate and that the way to get needed exercise in the tropics is to let a golf ball lead you to it, the big question was where courses could be laid out.

Granting that vigorous, outdoor-loving people were willing to shake off the temptation to grow lazy in the tropics the next thing was where they should shake it off. There were a lot of them who wanted to play golf provided they did not have to go too far. They wanted to play every blessed day and they knew they could pretty nearly do it in Manila if they could only set to the

course without traveling half the day in getting there and getting back.

It seemed fairly hopeless to find a closed in golf course until it was suggested that the Spanish military engineers who planned the Malls moat and campo of the walled city of Manila probably had in mind at the time that the thing would make a fine golf course some day after its usefulness as a Coffing enthusiasts took a trij around one day and it did seem as if those Spanish engineers had a head for golf whether they knew it or not. The whole thing was there. Natural hazards were there, beautiful grass



TOM NICOLL, GOLF INSTRUCTOR MUNICIPAL COURSE,

greens and faiways were there, and the breeze was always blowing from the bay; and they figured that there woud be sure to be a charm for every hole in the midst of these old world memories.

And so it has happened that a line of peaceful, white-clad pleasure seekers daily recreate in the shadow of those redoubts and grim battlements which were not to be approached by any man a couple of hundred years ago, and a barrage fire of golf balls rattles occasionally against the moss grown bastions. Those old walls many look down on the green Bermuda grass at their feet and see a lady with a club send a white pill saling through the air as far as the engines of war in use in those days could send a solid send a soli

It proved to be correct that the charm of those scenes would add to the lure of the



MANILA MUNICIPAL GOLF COURSE SHOWING PROXIMITY OF THE MANILA HOTEL TO FIRST TEE WHICH IS NEAR THE MONUMENT



links and that the convenience of a course that could be reached in a few minutes would do much for golf in the Philippines. The Manila Golf club which had beautiful land at Caloocan at the edge of the city got in behind the new project to popularize the game.

From the beginning, the course was made a municipal institution and it has been conducted on those lines ever since. By the time I arrived to take charge of the municipal course, it was already becoming very popular, especially for beginners. It was begun with only nine holes, but this was increased to Ils holes when territory along the edge of the waterfront was available and could be fitted.

With a little more than a year to get under way, the municipal course has more than justified its existence and has received wide advertising as one of the most unique golf situations in the world. As soon as the afternoon breeze begins to dispel dull care in every nook and corner of Manila the golfers begin



VIEW ON THE BAGUIO COUNTRY CLUB COURSE SHOWING IN THE PINE CLAD MOUNTAINS OF BENGUET



MANILA MUNICIPAL GOLF COURSE, LOOKING FROM MANILA HOTEI



MANILA MUNICIPAL GOLF COURSE LOOKING TOWARD THE FIRST GREEN

to appear on the Municipal course. It is pretty there, in the evening, with the sun slanting on the ancient battlements and in among the towers and roofs of the Walled City. There is a constant dull booming of bells and padres with flowing robes can be glimpsed at moments as they take their evening promenades on high terraces.

The other courses near Manila are of the natural wooded type familiar in the States, but with the difference that the stately palms, graceful bamboo and massive mango trees lend a new atmosphere.

Poor lies are exceptional on the 5,000 yard course of the Municipal links. The bunkers and traps are so arranged that while they make good play essential by the expert, they still provide alternatives whereby the poorer player can get the maximum enjoyment from his game.

The private course of the Manila Golf Club is at Calocoan just outside the city limits. The course is 5,000 yards long with grass greens, wide rolling fairways and possesses plenty of variety of play in the course of a round, having plenty of natural hazard to tempt the unwary. The clubhouse is golfen properly introducts, and wishting of the private of the course and caloud the course and clubhouse.

The La Loma golf course is a private one of nine holes with sand greens. It is beautifully located just outside of Manila. With its situation and natural features it is quite capable of being developed into one of the Baguio Country Club is situated in the town of that name in the mountain province of Benquet. It also has rolled sand greens and nine holes. Among the pine trees that this course is one of greatest enchantment.

The Pines Hotel has a course under construction in the town of Baguio. I had the privilege of laying out this course and I believe it has wonderful variety of holes. It here is the proving the proving the proving the proving the proving the alternative of a longer way around for the timid. It is planned to make a proving the pro



I have always been struck with the little nie hole course at Camp Eldridge, at the Los Baños military reservation. Visitors who go to Los Baños for its famous hot baths will find in its golf links a pleasant variety, as the hotel guests are granted the privileges of playing on it under certain conditions.

All the larger cities of the Philippines have excellent golf courses and it would be difficult indeed to find a large provincial town where a course of some sort cannot be discovered. The course of the Iloilo Golf and the course of the Iloilo Golf and Iloilo Golf and Iloilo Golf and Iloiloilo Golf and Iloilo Golf and Ilo

The Cebu Golf Club has a course just outside the city on a tract of rolling land. It is hard enough to make good play essential without being difficult enough to be discouraging. The golfers of Cebu are all entusiasts and their arms are wide open for outside golfers who come that way. Zambonago on the Island of Mindanao has a course, and the various military posts have them.

Golf has come to stay in the Philippines. The game provides an ideal form of exercise and recreation for the Orient. In Manila 120 monthly tickets were issued in the month of January on the municipal course and an average of 80 single round tickets were issued daily.

Especially after the establishment of the Municipal golf course, Manila people began to cultivate the game and now there are good players among all of the colonies of Manila. There is, of course, a part of every day when



MUNICIPAL GOLF COURSE, MANILA. BIGHTH GREEN AND NINTH GREEN

few people would care to get out and play golf, although it is not unusual to see some enthusiasts staying at the sport far into the heat of the morning.

In view of the fact that the Municipal course is only a hop, skip and a jump from the Manila Hotel, the Army and Navy Club, the Eliss Club and any of the Intramuros hotels, the first breeze of the early afternoon does not reach the course much ahead of the enthusiasts from one of these places. Business men can be off from the first tee within a few minutes from the time they leave their offices.

Well maintained roads leading out of Manila make approach to the golf links by motor easy and pleasant. Improvements, have been made to the Manila North Road recently which, with the Naguilian Road, makes a good avenue from Manila to Baguio, a distance of about 175 miles. It can be done in six hours passing through picturesque provinces and old Spanish towns. The Benguet Road, the first branch from the Manila North Road is one of the most picturesque and difficult pieces of road construction in the Orient. As the auto climbs higher and higher, new vistas are brought into range, the China Sea almost constantly in view, and the old Spanish forts seatered along the way offer many opportunities for the use of the camera.

Baguio is the health and holiday resort of the Philippines and the Sunday market brings the famed Igorot to the capital to trade with the lowland Flipinos. In all parts of the islands, the sport of the play for the tourist is mingled with that of the most delightful views of typical Philippine manners and customs. The caddies are quick-witted, lovable Filipino boys who have learned their work with characteristic aptitude.



HOTEL PINES GOLF COURSE NOW UNDER CONSTRUCTION. THIS NINE HOLE COURSE AT THE DOOR OF THE HOTEL PINES WILL ADD TO THE ATTRACTIONS OF BAGUIO HOTEL PINES IN BACKGROUND TO LEFT.



# The Woman's Club of Manila

By Miss Bessie A. Dwyer

They called it "The Society for the Advancement of Women," and its members smiled at the name. Some of them had already advanced sufficiently to do business in their own name, some were women with professional degrees, a few voted in their home States: all were representative of the best mentality of the feminine part of Mani-

Why then the anachronism? Because women are aware of the conservatism of men, and with that sweet art which has ever won its way to things supernal, deemed it wise to have a decent regard for the opinion of man-kind—especially in the Orient.

kınd—especially in the Orient.

Carrie Chapman Catr, returning from a
trip to lotus lands, slipped into Manila for
viewing sunsests and mooning about old
churches. Life is brief and Mrs. Catt had
something worth while to accomplish. She
called a meeting of women at the Manila
Hotel, August 15, 1912. It was fitting that
it is should be at the Manila Hotel; for the hotel
the sea by the genius of American engineers.



MRS. CONCEPCION F. CALDERON, VICE-PRESIDENT AND TREASURER, CHARTER MEMBER AND ONE OF THE MOST ACTIVE WORKERS OF THE WOMAN'S CLUB



MRS. C. S. LOBINGIER, FOUNDER AND FIRST PRESIDENT OF THE WOMAN'S CLUB

The women who met in that conference were builders too; they planned to rear a new cult of sex loyalty and progressive civic development, to recognize the spirit of religion while discarding its livery; to unite in one organization all creeds, all races and adopt as their watchword the ideal of public service for the common good.

There were twelve of them. (It may be remembered that there were twelve apostles of the risen Christ and that they rocked the earth.) So the Society for the Advancement of Women was formally launched.

Meantime, Mrs. Charles S. Lobingier, an experienced Club woman, rapped more than thirty women to order on the 29th of the same month, and it was evident that Mrs. the same month, and it was evident that Mrs. simulations of the same month of the same than the same th

The first year put the Day Nursery to successful test, and thereafter one each year was established. They have become a

Manila institution and are located in the thickly populated native districts.

Having spediets initial bolt and run up the victory flag, the women re-organized. The organization became a legally incorporated comparison of the search as a legally incorporated comparison of the search as a legal to the presidency to Mrs. L. B. Arnold, an army woman. Mrs. Arnold was not the only one. She found that to call the roll is to sound the name of practically every woman living at Military Plaza, or Fr. McKinley and not a few across the bay at Corregior and Cavico. In fact, the army woman espoused the or in its ranks with enthusiams, completely refuting the idea that she is wholly absorbed by the interests of her caste.

This administration saw the establishment of a woman's flower market, entirely run by Filipina women, close to the famous Bridge of Spain. It is a financial success but the club receives no profit whatever from it. Mrs. I. W. Littell succeeded to the acting presidency, and under her gracious direction,



MRS. GALICANO APACIBLE, FIRST VICE-PRESIDENT





MRS. JOSEPH P. HEILBRONN, SECRETARY WOMAN'S CLUB 1918,1920

Civic and Penology Committees were named Civic and Penology Committees were named and Day Nursery work largely extended. In 1914, Mrs. E. G. Saleeby came to the presidency. The year was fruitful of re-sult: a third day nursery was opened; three police matrons installed in the Luneta Police Station to care for women pending trial; an industrial teacher for the insane and feeble industrial teacher for the insane and feeble minded women supplied to San Lazaro Hospital and a woman's school, through the open of the supplied of the suppli stance of Vice Governor Martin, the Legislastance of vice Governor martin, the Legisla-ture passed Bill No. 2489. It gives back to each worker fifty per centum of earnings, at the time of release or before to support of dependent members of family upon the request of the prisoner. This is a long step and puts the Philippine Islands abreast of modern penology reform.

Arrangements were effected with the Bureau of Labor to maintain a special section for women seeking employment, to be known as "Women's Free Employment Agency," and the work put in charge of a woman employee; and an agreement was also made with the Director of Civil Service to certify, after three months, to the Director of Labor, lists of Civil Service eligibles who had not been placed in the classified service. This with a view to expediting opportunity to secure work for mercantile sources and to give merchants an opportunity to find equipped material through the Labor Bureau.

A Little Mother's League was formed and good service. The beautiful operetta did good service. The beautiful or "Snow White and the Seven Dwarfs, staged as a benefit for the Day Nurseries, by Alice Widney Conant, with such artistic perfection as to call for a second performance and win the hearts of the children and those older children-their parents.

At Christmas, each year, it has been the lub's practice to appropriate generously At Christmas, each year, it has been the Club's practice to appropriate generously for orphans, defectives, delinquents and lepers, special committees being appointed to handle the varied activities.

In 1915, the Club joined the Federation Women's Clubs, U. S. A., and has been

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since represented, at the annual meetings by some Manila member on a visit home. It is said that the veterans listen with unfeigned is said that the veterans listen with unlengment astonishment to the accomplishments of "sisters under the skin," ten thousand miles removed. The work of sending donations for Lafayette Kits began in this year and was kept up for the duration of the war; and the Club also adopted a French orphan. which it continues to support. It is hoped later to erect a monument to her, entirely the gift of her countrywomen.

The idea of establishing Provincial Women's Clubs was first broached by Laura L. Shuman, a charter member. Printed literature in English and Spanish was sent broadcast and club members began making provincial trips to interest provincial women. It was new and the appeal to the mother heart of womankind met with quick response.

In 1916, Mrs. A. S. Crossfield was elected President. Under her guidance the plan for free legal aid for indigent women was undertaken by two young Filipinas, and no phase of the Club's work has been more zealously carried on. These women lawyers have given time and professional aid, without money and without price, to their less for-tunate countrywomen, the Club merely suptinate countrywomen, the Club merely sup-plying moral support and necessary station-ery. In 1916, 31 cases were settled; in 1917, 42 cases; and in 1918, 103 cases, or a total of 176, in all. Twenty-six were fought through the Courts, 129 settled extra-judi-cially and 21 are still pending.

The Club went on record also as favorable to the establishment of a Juvenile or Minors Court and has every year since renewed its efforts to secure the court by petitioning and sending delegations to the Philippine Legisla-

In 1917, Mrs. N. M. Saleeby was drafted, in spite of her energetic protest for president, Mrs. Crossfield refusing re-election. The Civic Committee began an expansion that was like a harvest, to grow riper by the gleaning. The Municipal Board offered it 50.000 square meters of vacant land for vegetable planting and this land was taken over and assigned to schools and individuals, after soil analysis and irrigation possibilities had been investigated by the proper technical experts.

July 23rd the most sensational page in the Club's existence was written, when a special meeting was called to consider a letter addressed to it by Elwood S. Brown, Secretary of the Y. M. C. A., relative to vice conditions said to exist at suburban cabarets. This letter had the full endorsement of the Board letter had the full endorsement of the Board of Directors of the Y. M. C. A., also the Director of Health, Dr. J. D. Long. After a full discussion, a resolution pledging coperation in the fight against vice was adopted.

The position taken was abundantly justified, when in 1918, the federal and civil authorities completely abolished the dancing feature in cabarets.

On Occupation Day, August 13, the Civic Committee staged a Food Production and Preparedness Parade two miles long. In it every Department and Bureau of the Government was represented and all the other organizations of women and the majority of the large mercantile firms. It sig-nalized a campaign for home production of necessary food throughout the islands and swept down the Escolta and up the Bagumbayan drive like an army with banners. Out-side of religious processions, it was the first appearance of women in Manila in a public parade and it was proper that, as such, it should be in defense of the home.

In 1918, Mrs. C. G. Wrentmore was elected President, and in her opening address called for patriotic response to the Red Cross



MISS BESSIE A. DWYER, VICE-PRESIDENT AND CHAIRMAN THE PENOLOGY COMMITTEE OF THE WOMAN'S CLUB

throughout the year. At the next meeting the Club was addressed by Governor-General the Club was addressed by Governor-General Harrison, Mr. John Switzer of the Pacific Commercial Co., and Col. John Bellinger, Department Quartermaster, U. S. A., on food production problems. The Club took food production problems. The Club took its stand as against waste, and for abstinence from wines and liquous. In August of this Woman's Club to manage the woman's committees of the 4th Liberty Loan, Mrs. H. B. Pond was placed in indi charge of the club was placed in indi charge of the club was placed in the club was placed with the club Mrs. Calderon, Mrs. Vamenta and Miss Dwyer and a large sum realized for bonds. Women from every rank of life were present, not a few nuns leading their pupils in possibly their first excursion into the realm of the new woman. They came with college and school colors flying and they poured out money, like water, for the cause. A woman's section of a great 4th Liberty Loan Parade was drilled by Army officers and marched, the Filipina ladies wearing red and blue dresses and the Americans and Europeans white. They created a veritable sensation.

Later in the year, the Club, moved by medical revelations and by humanitarian motives, began work along social hygiene lines and opened the fight by petitioning the Legislature to add venereal diseases to the list of contagious diseases that must be reported by physicians. Literature and posters were distributed and the gospel of the single standard in morals carried to the provincial clubs with the purpose of enlisting their support.

The Welfare Board was requested to name five pensionados, three at least to be women, to go to the United States to study welfare work. The resolution met with success and young women will be named.

(Concluded on page 94)

# The Old Churches of Manila

hile the ancient ecclesiastical structures that abound in the city of Manila and its suburbs cannot be considered to be types of architectural art, when compared with the cathedrals of mediaeval Europe, they stand as monuments to the untold sacrifices made by laborious unskiluntion sacrinces made by laborious unskilled friar craftsmen who were responsible for the creation in the face of difficulties unknown in our times, as well as lack of funds and the proverbial laziness of labor. They are, moreover, masterpieces of solidity that have defied the elements, and some of them even the destructive earthquakes that have so frequently laid low all around them.

Only one of them, however, the church and convent of San Agustin, passed through the terrible ordeal of the earthquake of 1645, which left the walled city of Manila a mass of ruins. The years previous had been ones of peace and prosperity and Manila had become a city of stone, some of its buildings, as may be seen by the ancient ruins still abounding in many parts of the walled city, being massive structures. The only other church that was repairable was that of the Franciscans. It is said of this earthquake that it levelled mountains, filled valleys, dried up rivers and opened up new ones, caused some to overflow their banks and form lakes; made the Pasig change its course, and continued its work of destruction and terrestial change for over a vear.

THE CHURCH AND CONVENT OF GUADALUPE The church of Guadalupe was in reality a shrine built on an elevation of the left bank of the Pasig river by Antonio Herrera, a lay-brother of the Augustinian Order, a nephew brother of the Augustinian Order, a nepnew of the builder of the famed Escorial in Spain. It stands today a princely ruin on the heights of a ridge that slopes down majestically to the river near the quaint little village of San Pedro Macati, Rizal Province, but a short distance from the city. It was the shrine of the famous image of the Virgin of Guadalupe, cast in silver and stolen from the church in 1898 and never recovered.

There is a curious legend regarding Antonio Herrera. It is said that he joined the Augusti-



nian Order as a result of a duel in which he nian Order as a result of a duel in which he killed his opponent. The legend has it that the King of Spain had, by royal decree, laid a proscription on duelling in his realm. Young Herrera, who was a favorite of the King, fought a duel in violation of the proscription and in punishment the King gave him the alternative of the death penalty as provided by the royal order, or entry into a monastery and leaving the country. Herrera is said to have taken the latter choice and to have joined the Augustinians. Be that as it may, Antonio Herrera became an Augustinian and came to the Philippine Islands in 1600. He found the church and convento of San Agustin a wreck from the earthquakes and fires that had devastated the city, and set about to plan a permanent stone building. Juan Macias, an architect, had already commenced a plan for a new stone structure, but as the two could not agree, Macias was left to carry out his idea while Herrera was assigned the task of erecting the Guadalupe shrine. The work was commenced in 1601 and completed in seven years. The church and lower part of the convento were constructed of stone quarried in the neighborhood, and an approach ried in the neighornoord, and an approach in the form of a stairway with over 100 steps was hewn out of the solid rock. The ceiling of the church, like that of San Agustin in the walled city of Manila, was of solid stone. So well constructed were the buildings that

they withstood all the earthquakes until 1880 when, owing to the decay of some of the woodwork, serious damage occurred in the violent seismic disturbance of that year. In 1882 P. José Corruegedo, O. S. A., repaired the damage. The entire structure was destroyed in 1899 by American troops as a military measure.

### THE CATHEDRAL

The archdiocese of Manila was founded in 1595, 14 years after the arrival of Fr. Domingo de Salazar, the first bishop of Manila. The first cathedral was dedicated in 1581. The present building was raised to take the

place of the magnificent structure ruined by the earthquake of 1863. It was dedicated December 8, 1879.

The cathedral of 1581 was destroyed in 1600, rebuilt in 1604, and again destroyed in 1645. The third structure was begun the same year, that building resisting all subsequent shocks, until that of 1863 which completely ruined it.

pietery runed it.

The existing building is noted for its exceptional height. Its roofing timbers, especially those of the dome, were the best to be had in Luzon, more than usual care being taken in their choice and also in their inspection before use.

The cathedral contains the remains of several men of note in Philippine history, ancient, and modern, among them two Apostolc Delegates, Mgrs. Guidi and Agius; Archic Delegates, Mgrs. Guidi and Agius; Archishops Payo, Fernando Montero, Miguel de Benavides, Jose Segui and Jose Aranguren. There is also the tomb of Anda y Salazar. One chapel contains the remains of many men of note in the army and navy,

## SAN AGUSTIN CHURCH

The present church and convent, the most solid structure in the Islands, is 329 years old, its foundations having been laid in 1599. It stands on the site of an earlier light material structure built in 1571 and burned down in 1574. The plans drawn by Juan Macias, an architect noted in his day, did not meet with the approval of Fr. Antonio Herrera who as a proof of his theory as to anti-earthquake construction, raised the majestic Guadalupe shrine as a model. His argument was con-



H OF SANTO DOMINGO (DOMINICAN) BUILT TO THE LEFT IS THE SANTA ROSA CONVENT

vincing long before he finished his structure, and on an improvement of Macias' foundations he built the present pile, completing the

San Agustin's is the only church in the Philippine Islands known to be built with a crypt. Owing to the softness of the subsoil, Herrera realized that Macias' foundations would sink out of sight under such a heavy building as it was intended to construct, so he performed the feat of "piling" with solid masonry. Ancient records give only a bare hint as to the true nature of these foundations, but it is generally believed that they go to a depth of from 10 to 12 meters, and consist of pilars of masonry joined by heavy stone arches forming an immense crypt long since filled up with silt that has found its way by seepage through the outer retaining walls.

A notable feature in the construction of this edifice is the massive stone ceiling over a meter thick. The terrific earthquake of 1645 opened a crack in the ceiling into which a hand could be inserted, but subsequent a nand could be inserted, but subsequent shocks so closed it that today it is almost impossible to insert a sheet of paper. This building has successfully resisted the seismic disturbances of 1645, 1754, 1852, 1865 and 1880,

all of which were particularly destructive.

The church and convent cover an area of 21,212 square meters. In 1635 a Spanish artilleryman, who had

murdered his paramour on the street, fled to the high altar of this church for "sanctuary." The military authorities, however, violated this ancient right and the hapless man was dragged from his refuge into the square in front of the church and there publicly hanged. This church contains the tombs of Miguel de Legaspi and Juan Salcedo, his grandson.

# FRANCISCAN CHURCH

The second substantial stone structure raisand the second supstantial stone structure land ed in the city, it stands on the site of a light material church built in 1577 and destroyed by the fire of 1583, and covers an area of 28,-590 square yards. In 1584 it was rebuilt in wood and tile and in the convent adjoining was installed the first drugstore in the Philippine Islands from which all the Archipelago pine Islands from which all the Archipelago was supplied for many years. In 1602 it was rebuilt in stone throughout but while it quake of 1645, it was almost ruined by that of 1739. Reconstruction began in 1740, since which time the building has withstood almost all seismic shocks. During the earth-quake of 1624 the tower fell, and during that f 1863 a part of the roof caved in. Among the famous images on its altars is that of San Francisco, the patron of the church. This image had a remarkable history. According



TONDO PARISH CHURCH. ONE OF THE MOST HISTOR-ICALLY INTERESTING OF MANILA CHURCHES OUTSIDE OF THE WALLED CITY.

to the legend, the padres traded off the image in 1630 to Alonso Cuyapit of Paco for another of more intrinsic value. "During that earth-quake (1645)" says Fr. Felix J. Huertas, the Franciscan historian in his *Bstado Geografico* etc., page 14, "the image went by itself from the small altar on which it had been placed to a window that looked toward Manila, and falling on its knees on a small box remained crying four days and nights, and when replaced four times on its altar, by D. Alonso each time returned to the window."

In September 1668, Governor Diego Sal-edo was arrested by the Holy Office of the Inquisition as a heretic and confined in this church pending his transfer to Mexico. The church of the Third Order of San Francisco standing in the same square was first built in 1618, the present building dating from 1723.

## SANTO DOMINGO CHURCH

This church is one of the largest and most substantial buildings of its kind in the city. substantial buildings of its kind in the city. The present structure is modern and stands on the site of the original church and convent raised in 1587. When the Dominicans arrived in the Islands, the land on which the Ayuntamiento, the University of Santo Tomas, this church and convent, and other continuous buildings stand, was a swamp and but a small part of it was terraplened. The Dominicans bough the land for 300 pesos and had to take possession of it and take out the site in a banca. The first church was built in 1587 at a cost of 3,000 pesos. A stone structure was raised on the same site in 1593, but burned down in 1603. It was built the following year, again in stone, only to fall in the earth quake of 1610. Again reconstructed, it stood until 1864 when it was destroyed by the earthquake of that year. The present structure was raised in 1870. This church is noted for was raised in 1870. This church is noted for its image of Nuestra Señora del Rosario carv-ed 600 years ago by a Chinaman who late the control of the control of the control of the this image is said to have been due the naval victory of the Spaniards over the Dutch in Manila bay in the early days, and she was looked to in 1898 to bring about the destruc-tion of the American fleet under Dewey, but somehow the combination failed.

# SAN NICOLAS DE TOLENTINO (RECOLETAN) The first priests of this order reached Manila in 1606 and immediately established them-selves on what is now the site of the Army

Morgue on Bagumbayan where they built the church of San Juan Bautista, later de-stroyed as a military measure as the British in 1762 seized it and used it as a fort in the re-duction of Manila. The present church was commenced in 1612. Subsequent earthquakes, specially that of 1645 did much damage to the building but the present structure is substantially the original one. Among the famous images on its altars are Nuestra Senora de Consolacion and Nuestra Senora de Salus, both brought from Mexico in 1653.

#### SAN IGNACIO

Built in 1878 as a monument to St. Ignatius Built in 18/8 as a monument to St. Ignatus by Padre Juan Bautista Heras, S.J. Prior to their expulsion from Spain and Spanish possessions in 1768 the Jesuits had an ex-tensive establishment in the Philippines. While much has been said from time to time of the massive structures raised in the city and its suburbs by the Augustinians, Fran-ciscans, Dominicans, and Recoletos, little is generally known of the great work done by the early Jesuits. It was a Jesuit father who designed and directed the work on the first stone fortifications that comprise Fort Santiago and much of the city wall.

On the open space in front of the Delmonico On the open space in front of the Delimonico Hotel in the walled city there once stood a church that was equal to any in the city today, raised by the Jesuits, but destroyed by earthquakes. This church was built in 1596 by Father Sedeño, S. J., who introduced the art of brick and tile making into the islands and the use of stone in public buildings. He was in fact the city architect. It was then rewas in fact the city architect. It was then re-built in stone throughout and withstood many severe shocks until 1873. The Jesuits were also the founders of the girls' college that after-wards became known as Santa Potenciana.

Ever in the front rank of progress the Jes uits were the first to introduce the use of electrical light and the telephone in the islands, illuminating Malacañang Palace the occasion of a fiesta in 1878 and installing a telephone from the Ateneo Municipal to the Normal School. In 1859 after their return to the islands the Iesuits purchased propturn to the islands the Jesuits purchased property on Calle Arzobispo where they built a temporary home, using the church of the Royal College of Santa Isabel for public worship. After the destruction of the church by the earthquake of 1863 they decided to build one for themselves. The plans were prepared by Felix Roxas, father of Felix M. Roxas, ex-mayor of Manila, and the corner stone was laid in 1878. The granite for the facade was brought from Hongkong and the marble used in the interior from Italy. The bells of the original church were installed in the new one which was completed in 1881. The statues and all the exquisite carving throughsculptors.

# SAN VICENTE DE BAUT (MARCELINO)

The most recent construction of its kind in Manila, the foundation having been laid in 1911 on land purchased in 1875. Built in Renaissance style of architecture, in the form of a Latin cross; the nave is 50 meters long and 25 wide at the cross section. The dome and towers are built on a hundred wooden piles. The building cost all told P100,000. The plans were laid by Francisco P100,000. The pians were and by Francisco Perez Muños and the building constructed under contract by R. Loper. It is of rein-forced concrete throughout. Among notable things in the church is the magnificent altar cloth made by the sisters of La Concordia and valued at over \$\mathbb{P}\$1,000. The statues on the altars are among the most beautiful in Manila, and were carved by Filipino sculptors.

#### TONDO CHURCH

When the early Spaniards reached Manila they found two large settlements, one Manila proper, fortified and dominated by Rajah Soliman, and Tondo dominated by Rajah Lacandola, Soliman's uncle, both of them Moros candoia, Soliman's uncle, both of them Moros as were most of the leading men of both settle-ments. The evangelization of the people was at once begun by the Augustinians and the first mission to Tondo established itself on the site of the present magnificent church on the site of the present magnificant charles in 1572. A temporary church was raised and Alonso Alverdao was chosen the first prior of the district which then embraced Taytay, Cainta, Pasig and Bay, Laguna. Little is known of the nature of the several buildings that succeeded one another as the earthquakes continued their destruction except that prior to 1863 a pretentious building existed. The present church dates from 1874 and was the work of Padres Casimiro Herrero and Manuel Gonzalez, both Augustinians,

Many of the most notable men of the Au-Many of the most notation men of the Au-gustinian corporation have served as parish priests of Tondo, among them Augustin de Alburqueque, 1575, the author of the first Tagalog dictionary; Diego Mojica, 1577; Je-ronimo Marin, 1578 and Juan de Peña, 1579, all three indefatigable missionaries. Diego Muñoz, 1583, the first Commissary of the Inquisition, and Cristobal Tarique, 1582; Alonso de Castro, 1583, and Juan Delgadillo, 1584, who had a part in the raising of the first permanent stone church and convent.



METROPOLITAN CATHEDRAL OF MANILA. REMARKABLE FOR HEIGHT OF NAVE AND FOR HISTORIC TOMBS IT CONTAIN

The present church has three naves and is of Ionic style of architecture, 65 meters long and 22 wide. It was Padre Mariano Gil, a parish priest of Tondo, who made public the existence of the Katipunan Society in 1896.

#### MALATE CHURCH

The quaint little church of Malate was built by the early Augustinians who founded the parish in 1588. The present church is a composition of three structures, the facade raised in 1590 by Fr. Diego Gutierrez, the body built in 1864 by Fr. Francisco Chadrado and the sanctuary in 1895 when the church was restored by 7th 250. Dalato. The three restored by 7th 250.

restored by Fr. Nicolas Dulanto. Inc unexcover a period of 305 years.

Like Tondo, Malter had among its early.

Like Tondo, Malter had among its early.

Like Tondo, Malter had among its early corporation of whom may be mentioned Diego Gutierrez, 1590, Diego Leyva 1598, Juan B. Hernandez, 1602 who made the first restoration after the earthquake of 1600; Juan de Peñalosa, 1607, Juan de Montesdox, 1608, Juan de Peñalosa, 1607, Juan de Montesdox, 1608, Juan de Wontemayor in 1614 and Luis Ruizjoined the church but was removed a few years ago to make way for the present clergy house and the extensive garden.

### OUR LADY OF LOURDES (CAPUCHIN)

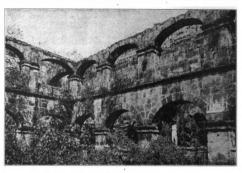
The most mode church in the shalled city and the shall church in the shalled city and the shall church shall church shall church built in 1910 in restoration of a former temporary church built in 1897. The plans were laid by the well known Spanish architect PerezMuñoz. Part of the old structure, formerly a private residence, was retained, the facade and interior of the church being of fracade and interior of the church being of facade and interior of the church being of full in its simple adornment. The statutes and all the wood carving was done by Filipino sculptors. The statute of Our Lady of Lourdes on the light altar is a remarkable piece of on the light altar is a remarkable piece of

work executed by Manuel Flores.

Before this altar in 1898 prayers were offered day and night for several weeks for protection against the threatened bombardment of the city by Admiral Dewey.

# SEBASTIAN CHURCH

The most unique church in the city. The present Gothic structure is "knock down" one constructed in sections in Belgium and



VIEW OF RUINS OF AUGUSTINIAN CONVENT AT GUADALUPE, RIZAL PROVINCE

shipped f. o. b. to Manila where it was erected on the site of the ancient structure runed by the earthquakes. It is of iron throughout, 55 meters long and 25 wide. The construcmagistic in height, the stained glass windows brought from Europe, and illustrating events in the life of Christ, are the finess it the city, rich in tone and in the wonderful variety in the figures they contain.

The first church was built in 1618 and reconstructed in 1866.

#### BINONDO CHURCH

Built by Dominican parish priests in connection with their mission work among the Chinese. The first church stood on the large block on Plaza Moraga, facing the Escolta and was known as San Gabriel. It was later removed as a military measure. The Dominicans then moved to the other end of Rosario to where the present church stands. Several buildings were raised on this site owing to the destructive earthquakes. The present building is of massive proportions.

# Woman's Club

(Continued from page 91)

In 1919, Mrs. F. O. Smolt was elected President and in her opening address called for larger development.

The response of the government to the Club has been generous. Realizing its inability to finance the expanding nursery service, first P.5000 was requested of the Legislation, the control of the control

A People's Kitchen will be tried out this year in Mania, the Welfare Board having allotted P5,000 for the experiment. They have also under consideration the setting aside of a sum of money to stimulate the experiment of the property of th

And so, full of good deeds and honors, we leave them. It is not a fashionable Club; it is a working one. They lack even a Club House and are often troubled for ways and means but are unfattering in duty and trust in Providence—a faith realized.



RUINS OF THE SHRINE OF NUESTRA SEÑORA DE GUADALUPE, ADJOINING AUGUSTINIAN CONVENT



# The Coconut Industry of the Philippines

The Philippines are so exceptionally favored by nature that they have a monopoly of one great tropical product, Manila hemp, and are the largest producer of another great tropical product, coconuts. During the past two years war conditions have so accelerated the part of the past two years war conditions have so accelerated the products are now shipped in the shape of oil, whereas formerly they went to Europe and the States in the form of copra. Throughout the history of the Islands these two items have constituted the only products of the coconut tree that have entered its ex-

Coconut trees are found all over the tropics particularly in the South Sea islands and the Philippine and neighboring archipelagos. When Magellan, the first European, came to the third property of the seacoast. According to De Candolle, it is very possible that the tree is indigenous to the Philippines, and that the Visayan islands are the focus from which were proparated by the property of the

In the first half of the 19th century it was discovered that the oil contained in the coconut meat was especially suitable and desirable for the manufacture of soap. In order to transport the meat economically, it was necessary to extract it from the nut and it then had to be dried in order to prevent loss through the mold which attacked it when wet. The resultant product, dried oconut meat, is called coprax or copra, and large quantities were exported to Europe from Ceylon and India.

In the late eighties, a British exporting firm in Manila, brought in some of this coppar from Singapore as a sample to show the natives how to prepare the article of commerce, the same of the sound of the same of the same

The exports from the Philippine Islands for subsequent years were:

[From	M	LI	ú	la	2	M	e	n	c	h	a	n	t	ď	1	b	18	o	c	iation Report
19	17.																			. 92,180
19	16.												,							. 72,277
19	15.			ı,			·					÷								. 139,092
	14.																			
	13.																			. 82,219
																				Tons.

In reading these figures it should be noted that other centers, notably Ceylon and Macasser exported large quantities of oil, it is not the control of the c

The second great boom in coconut products came with the discovery by French and German scientists that the residual press cake after extracting the oil from the copra was an admirable cattle feed. France, Germany and Holland invested large sums in recting oil

mills. England, one of the largest users of the oil did not engage in the oil-crushing industry to any extent because their herds of cattle were smaller, and their owners not so readily adaptable to change in methods of feeding. The following table shows the imports by principal ports:

Year.								Marseilles	Hamburg	London
1897		ı	ı					63.032	10.791	12,137
1900		ì					i	94,360	21.034	27.637
1903				ì				95,459	48.586	39,132
1906							i	97,720	83,669	26,902
1909								. 133,706	155,989	33,979
1910								146,564	148,066	
1911										

Early in the twentieth century it was discovered that coconut oil could be refined so as to serve as a base for margarine and artificial butter, and as a chocolate at, refined and the serve and as a chocolate at, and a serve as a s



TRANSPORTING COCONUTS BY RAFIS

Exports of Copra

| CFrom Leubouit, Chan. Tech. of Oil Fatt. 46...) | Column | Colum

Unfortunately this mill was burnt to the ground by a disastrous fire in 1908 so that manufacture in Manila and Europe was not definitely decided for the business world, and for some time the old method of ship-and for the some state of the could be made in bage which are a cheap could be made in bage which are a cheap container and subject to no appreciable leakage. Oil, at that time, had to be shipped in special steel draums which were returned.

ed empty half way around the world. The European factory enjoyed heter labor conditions and better facilities for manufacture. They had a market near at hand for the residual cake, whereas cake shipped from the Philippines was thought to arrive in inferior condition and was a dangerous fire risk for the steamers transporting it. Furthermore from which to draw its raw material which was not so subject to violent fluctuation.

It was clear, however, to Mr. Thompson, that there were compensating features to offset the advantages possessed by the European and American mills and he pensisted in this field until he interested new capital in erecting the second mill ever put up in the Philippines. This mill, the Philippine Vegetable Oil Co., known throughout the Islands as the "P. V. O." was erected on the north bank of the Pass; in Manila, in 1913 nearly barnet down. It has been in continuous operation ever since, and has made large profits.

The great success of the P. V. O. and its successors was due to the natural advantages possessed by oil shipments over copra. Bar-reled oil takes up little over half of the bulk space required for copra based on oil content, and thus enjoys a lower freight rate. Oil can be shipped on any steamer whereas passenger vessels can not accept copra because of the objectionable odor. There is less loss in handling the raw material and a better grade of oil can be turned out because the coora when fresh does not yield so high a content of free fatty acids: furthermore, for a given weight of copra a larger extraction of oil can be secured before than after shipment. Last, but not least of the many advantages of local mills, is the ability to ship oil in the ballast tanks of steamers or special fuel oil tank vessels. This was not contemplated in the early days of the industry but is now almost universal.

almost universal.

The third venture in the Philippines was the mill built at Opon near Cebu, by the Visayan Rehning Co., a subsidiary of the American Philippines Co. This latter company was organized through the efforts of Dean C. Worcester, who had been for thirteen years Secretary of the Interfor in the Philippines Co. The Co. Worcester is the Philippines of the Philip



TRANSPORTING COPRA TO MARKET BY PACKHORSES

ippine service. Mr. Thompson was active in the construction of this mill also, and it differed from the earlier mills in that it not only used the Expeller system which had proven so satisfactory, but also used improved hydraulic presses. The earlier French systent had been to express oil with heavy presses, and as this was a non-continuous process, it was slow, expensive, and required much labor. In the Expeller system the triturated copra is fed steadily in against a revolving screw which expels the oil through one ori fice and the cake through another. While much quicker, it does not obtain so large a proportion of the oil as the slower press process. It is now general practice in many Philippine mills to use both systems, although during the war, when prices were such as to place a premium on speed rather than economy, the Expellers were used almost exclusively.

Clusivery.

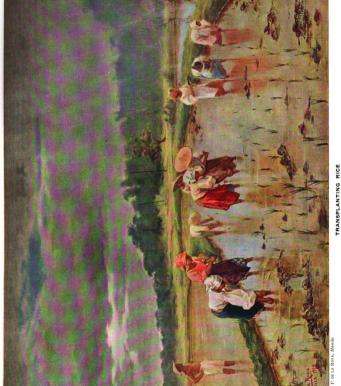
Both of these mills were in full operation when the war started in 1914, and the retended to the state of th

When the profits in the industry first became apparent there arose a tendency to erect new mills. The first of these was the Philippine Manulacturing Co., Tondo, Manila, which was already manufacturing soap. Carrero, Vidal & Co., Luzon Kehning Co., and started late in 1916 and in 1917. Some of the new mills sold their product to the older established mills, leaving them the task of marketing the oil in the States. This method represented a substantial profit but the biggest returns were secured by the in-

the buggest returns were secured by the independents, who marketed their own oil.
Aided by the exceptionally favorable
and an index of the control of their own of their
all mills, and there was a rush to bring out
new Expellers. The United States was
at war and shipments were greatly delayed
so that the new machinery ordered at that
time is still conting into Manila in small
time is still conting into Manila in small
successful importers were those who paid
fancy prices for second hand machines in the
southern cotton seed oil mills and thus obtained prompt delivery. Those who could
chinery became auxious at least to own stock
in the established companies. The resultant
boom in stocks was the first in Manila's
history, and is a promising indication of the
impending change from a purely agricultural
to in the established companies. The resultant
bom in the shade of other than the chief interest
in this industrial activity was taken by the
Flipinos themselves. Heredoroe, the external commerce of the Islands and its large
be in the hands of other than native capital.



THE CONSTRUCTION OF FIRST-CLASS ROADS THROUGH THE COCONUT GROVES HAS REDUCED TRANSPORTATION COSTS TO THE MINIMUM. AUTOMOBILE TRUCKS HAVE TAKEN THE PLACE OF PACK HORSES



This was in part due to the fact that until 1917, the only banks in Manila had been of foreign or largely foreign capital; but in that year was founded the Philippine National Bank which is operated with the assistance of Government funds and has greatly contributed to development of the resources of the country by its own people.

Like all good things there have been instances in which this boom in stocks has been overdone. The rapid increase in the number of Expellers, from 16 in 1915 to over 200 at the present (March 1919) has caused so great a demand for copra that the price has risen to the point where only moderate returns can be expected for awhile. This will put a premium on efficiency, however, and in the end prove a benefit to the Islands. Since the production of copra may be expected the production of copra may be expected to double every five years it will not be long before an adequate supply will be obtainable. To show how the industry has grown from the single company of 1913, a list is appended of the factories organized and ready for operation as of March 31, 1919.

OIL MILLS OF THE PHILIPPINE ISLANDS

American Refining Co. Arandes, Francisco.
Carrero, Vidal & Co.
Central Oil Corporation
Cooperative Coco Products Co.
Cooperative Copra Extracting Co. Copra Products, Inc. Cristobal Oil Co. Eastern Oil Co. Fabrica de Aceite de Filipinas. Francisco. Evaristo. Francisco, Evaristo. Franco-Philippine Oil Co. General Oil Co. Harrison, R. J. Hispano-Philippine Oil Co. Ilog Cauayan Oil Co. llogi Cauayan Oli Co.
Iloilo Oil Co.
Insular Phil, Coco Oil Co.
International Oil Co.
Laguna Coco Oil Co. uzon Refining Co. Madrigal, Vicente Magallanes Oil Mills Manila Coconut Oil Co.
Manila Oil Refining and By-Products Co.
Misamis-Surigao Oil Co.
National Coconut Oil Co.
Oceanic Oil Co. Oil Development Co Oriental Coconut Oil Co. Oriental Copra & Oil Export Co. Palanca-Choy Oil Co. Panay & Negros Oil Co Philippine American Oil Co. Philippine Mfg. Co. Philippine Oil Products Co. Philippine Refining Co. Philippine Takushoku Kaisha Philippine Vegetable Oil Co.
Poizat Vegetable Oil Mills
Rizal Refining Co.
Samar Products Co.
Sta Ana Oil Mills, Inc. Tan Luan Oil Mill Zamboanga Oil Co. Escudero Oil Co. Visavan Refining Co.

Of the above mills only 18 were in full operation during October, 1918, the latest month for which official figures are available. These 18 mills were equipped to produce 964 short tons of oil per day, produce 964 short tons of oil per day, but their actual output was only 523 tons, both figures based on a day of 24 hours. When all the mills in the above list are in full operation they will have a possible maximum production of over 1,300 tons per day or 455,000 tons per year. It will be many a year before this maximum can be realized.

The development of the oil business in Manila has been coincident with, and con-

ducive to, progress in the industry in the United States, which has been the sole mar-ket for the Manila product throughout the war period. It was originally the custom to ship oil in strong steel containers which had to be returned from point of destination when empty. During the war it was impossible to obtain these steel containers in anything like sufficient quantity and circumstances fire summent quantity and circumstances forced the adoption of wooden barrels. These were shipped out from the Pacific Coast, knocked down, and assembled in Manila. The package was obtainable in very large quantities and at much less cost than the steel drums and the business has grown to very large proportions. It is estimated that during 1918 over 120,000 barrels were used. One barrel company has a large coopering and assembling plant located in Manila.

A still better form of shipment was soon devised in the utilization of tank steamers, The Standard Oil Company owns several large tank steamers which carry fuel oil and petroleum from the Pacific Coast to the Orient but these usually returned in ballast. not believed feasible to ship vegetable oil in these tanks because of fear of contamination from the residue of the fuel oil. The Visa-yan Refining Company, however, believed they could overcome these difficulties and by cleaning the tanks with live steam, swab-bing them up with the copra meal itself, they accomplished the task, working a complete innovation in the trade. It was then necessary to provide proper facilities in the States for discharging the oil into storage tanks, and forwarding it in tank cars. There was a short-age, and still is, of both the tanks and the cars, but leading oil mills have begun construction of their own tanks in San Francisco and Seattle, and this difficulty will soon be a thing of the past In the meantime the largest users of oil in the States are also falling into line and equipping themselves so that they can handle and store the bulk oil.

An interesting feature about bulk ship-nents of oil is that, while coconut oil in the Philippines or any tropical climate is a liquid, it becomes in a cold climate a solid fat slightly resembling paraffine. In order to discharge from a vessel's tanks oil which has solidified,

steam pipes are run into the hold of the vessel and steam can be turned on when desired, thus melting the oil so that it can be pumped

The following table shows by years until 1918, and by separate months for that year, how rapidly the industry expanded in Manila.

Exports of Coconut Oil from the Philippines [Courtesy of Manila Merchants' Association.]

Years	Kilos	Value
1907	50,662	P101.324 00
1908	3,915,114	684,560 00
1909	1,184,170	
1910		32.00
1911	-	
1912		80 00
1913	5,010,000	2,292,678.00
1914	11,943,000	5,238,356.00
1915	13,464,000	5.641.003 00
1916	16.091,169	7.851,469.00
1917	45,198,000	22,818,294 00
1918	115,281,938	63,328,317.00

The future of the coconut industry in the Philippines will be one of the bright spots of Philippines will be one of the bright spots of the country's history. The average rainfall throughout the coconut growing districts in a year is not far from 90 inches, or more than some districts of Arizona get in 30 years, \* so that the production of nuts is more favored than anywhere else in the world. It is unfortunate that the rainfall which makes such fine nuts at the same time makes it difficult to sun-dry the coconut meat. As a result the Philippine copra is usually praised for its quantity and blamed for its quality. It is only a question of time, however, when mechanical dryers will be available and then the Philippine copra production will leave nothing to be desired. We are today only at the threshold of the development of the coconut industry. In this opening act, just ending as the curtain has been rung down on the World War, actors have held the stage whose successes rival the stories of the Arabian Nights. With the tremendous possib-ilities of the P. I. still scarcely touched who shall say that as marvelous a chapter shall not be written during the next decade?

\*Atimonan averages 106 inches per annum; Sorsogon, 220 inches; Yuma, Arizona, 3.1 inches.



MEAT FROM THE COCONUT, AFTER WHICH IT IS CONVERTED INTO COPRA BY EITHER OF THREE METHODS—SUN DRYING, KILN DRYING OR MECHANICAL DRYING FIRST REMOVING THE MEAT FROM THE COCO

### The Philippine Mining Industry

By Frank B. Ingersoll.

The history of gold mining in the Philippine Islands runs back through the ages until lost in the mazes of tradition.

Chinese writings of as long ago as the third century report gold as the chief product of

From Morga, a Spanish historian, we gather that, before the coming of Magellan, the Philippines carried on Commerce with China in which gold, dye-stuffs and edible birds' nests were exchanged for cloth. In this connection it is interesting to note

In this connection it is interesting to note that the leading gold-producing districts of today are the same which yielded most to the primitive methods of the native inhabitants in olden times.

The Filipino miners (especially the women) handle their wooden gold pans with a skill unexcelled in the world.

The Spanierds, always indefatigable prospectors, were active in the search for the of the ladness. After Don Juan Salcedo conquered the region known as the Province of Laguna he heard stories of enormously rich gold mines on the Pacific coast of Luzon and at once started in search of them. After racale and verified the reports of the richness of the deposits worked by the natives.

There can be no doubt, judged by primitive standards, gold mining was for centuries successfully carried on by the inhabitants of the Archipelago. They had no machinery, no tools, no explosives and no pumps. But native miner gouged out the rich stringers, pounded the ore into powder and panned off the free gold, just as he skilfully washed the top layers of the gold-bearing sands from the ancient river beds.

The implements which the natives use—a washing board and a large shallow wooden bowl—are of great antiquity and form a prominent feature in the household utensils of all native villages in the auriferous region. Boulders and fragments of quartz with visi-

ble gold occur in many alluvial deposits in the Islands and it is not likely that the natives would have thrown them aside without endeavoring to extract the gold. This they probably did in ancient times, as they do it even now, by pulverizing the quartz by had and washing it as they wash the auriferous sand and gravel.

For pulveriting the ore the natives use a species of trip hammer, made by attaching a heavy stone, serving as a head, to a spling, A second stone answers for an anvil. After placing the quartz on the anvil the workman drives down the head, the elasticity of the division of the placing the quartz on the anvil the workman drives down the head, the elasticity of the crushed quartz is ground in an arrastre, concentrated in a bateal (wooden dish) and washed clean in a coconut shell. In this last operation as soapy vegetable say (oggo), squeezinon as one of the companion of the compa

Philippines to good won by the native found in the Philippines to good won by the native found its way into China through the medium of Chinese traders who visited these shores in their junks. The mining sections close to the sea coast were also favorite raiding grounds for hordes of Moro pirates, attracted thirber by the gold, even after the Islands were under Spanish dominion. One of the most interesting stories, and one which seems most interesting stories, and one which seems not interesting stories, and one which seems Doña Panay, a rich native woman of Mambulao. Camarines Norte, who sent a petition

to the Queen of Spain asking protection against the pirates and accompanying her request with a present of a life-size her and a setting of eggs, all of virgin gold. On the hill above the portal of the famous old "Ancla de Oro" tunnel in the town of Mambulao are the ruins of an ancient fort erected in response to the prayer of Doña Panay.

Back in those days, according to accounts more or less reliable, the town of Mambulao, which lies on a sheltered deepwater harbor, was the second city of the Archipelago with something like 60,000 inhabitants. Today the entire municipality numbers perhaps 3,000 souls.

Tradition indicates that at many points in the Philippine Islands the placers were originally very rich; and this there is no reason to doubt. According to Morga the natives worked them with more energy before the Spanish conquest than after it.

Spaniards coming from Mexico early settled in Camarines Norte and brought with them the Mexican methods of treating the ore. In Morga's time (1609) the reduced; royalty yielded \$10,000 annually, and Gemelli Carreri learned from the Governov-Coneral at Manila reasonable figure since such a royalty was sure to be evaded in a large measure.

Although Camarines Norte was the best known gold producer there was undoubtedly considerable of the precious metal turned out in Benguet and Nueva Ecija on Luzon, at Aroroy in Masbate, and in Misamis and Surigao in Butuan province.

One of the most romantic episodes in the history of Spanish mining in the Philippines was the career of the Iamous "Ancla de Oro", a company which was organized to develop a company which was organized to develop planned to obtain access to the vein below ground-water level by constructing a sealevel drainage tunnet. The prospectus delevel drainage tunnet. The prospectus dealevel drainage tunnet had been bought and sold as early as 1788. The vein was said to be "two palms" wide, the quartz of it being literally pearance of the richest altar hanging," not only the vein but "the dajacent walls are also gold bearing". The document ends with the stirring appeal:

"To those who love their country the opportunity now presents itself to show that they interest themselves in her progress and welfare. One hundred pesos is the cost of a share, payable in four installments. Even servative should not be realized the loss of one hundred pesos will bankrupt no one, so we have no doubt that all will take shares in the enterprise which is his day initiated.—Maranda."

19, 1646, 18470 Sainz de Baranda.

The tunnel was projected to run into the mountain for a distance of a thousand meters but actually penetrated but 75 meters, the difficulties encountered being too great to overcome with the crude methods and equipment of that period. The well preserved portal of their drainage tunnel may still be seen and is usually the first evidence of mining to catch the eye of those who enter the bay at Mambulao by steamer.



BENGUET CONSOLIDATED MINING CO. MILL AT ANTAMOK.



GOLD DREDGE DIGGING CHANNEL THROUGH BEACH

It remained for a company operated by American and Filipino capital seventy years later to complete a drainage tunnel at exact-ly the same site of the old "Ancla de Oro" after three and a half years of persistent work, attended by heavy expense and serious obstacles.

Activity in mining among the natives received a severe setback by the prohibition imposed by the Spanish government in 1894. It was shortly prior to this time that European capital (mostly British) began to make pean capital (mostly British) began to make mining investments in the Philippine Islands. These were confined almost entirely to Cam-arines Norte. One British concern planned operations on a large scale. Several quartz properties were opened up and considerable expensive machinery brought out from Engproperties machinery brought out from England. Just when the project was getting fairly under way the Philippine insurrection of 1896 broke out. The English engineers in charge field for their lives and the machinery and mine workings alike fell into dissue and decay. However, the state of the machinery and mine workings alike fell into dissue and decay. However, the state of the

claims by proceedings patterned after the practice in the United States, there was no practice in the United States, there was no legal recognition of such steps until after the passage of the Philippine Bill (the Act of Con-gress of July 1, 1902), which put a new min-ing code into effect. From that point there has been a steady

growth in the mining industry, notwithstanding that there has been a scarcity of capital, a lack of transportation facilities, of reliable a lack of transportation lacinics, and labor and of competent superintendence and ianor and of competent superintendence and insufficient and to some extent unfriendly laws, together with a want of appreciation both by the Government and by the people, of the insufficient of the control of the con both by the Government and of the importance of the industry.

of the importance of the industry.

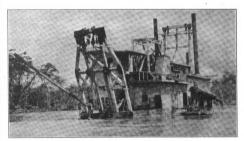
Although prospecting and development was actively going on during the first few years of American occupation, the gold output did not reach appreciable figures until 1907 when it amounted to \$\mathbb{P}\$187,647. Thereafter there was a steady advance in production until it reached \$\mathbb{P}\_3,011,755 in 1916.

In 1917 it fell down to \$\mathbb{P}\_2,816,638 while

for 1918 it will probably be still slightly less. The recent falling off in the output is largely due to war conditions which prevented ly due to war conditions which prevented continuous operation from lack of proper materials and supplies. Added to this there has been a decided letdown in the production from dredging. This has been confined entrely too me fidel—Paracale—where the alluvial deposits are being exhausted. Although attractive fields have been proven by testing in other districts, war costs have put a prohibition on an yew installations. At recent gold mining is limited to three districts—Masbate, Benguet and Paracale. In Benguet there is but a single quartz mill operating, while Masbate (Aroroy) has two.

operating, while Massate (Aroroy) has two.
At Paracale five dredges are at work.
The future of gold mining presents some difficulties, at least until operation costs have been cut down to something like normal.
Conditions which increase the cost of opera-Conditions which increase the cost of opera-tion often serve to change a paying mine into a losing one. This is well illustrated by the effects of the recent great war. The outlay for materials, supplies, labor and in fact for everything which enters into operation costs has increased tremendously. In other lines of industry the increased costs of operations or industry the increased costs of operations has been met by increasing the selling price of the product. As the selling price of gold always remains fixed no remedy is open to the miner. His business which pays under

(Concluded on page 108)



GOLD DREDGER WORKING IN PARACALE DISTRICT.



REPAIRING BUCKET LINE ON GOLD DREDGE

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### The Philippines-America's Trade Gibraltar in the Far East

If the United States is to retain the place as a commercial power that she has acquired during the progress of the great war, she, in common with the rest of the world, must

turn her eyes to the vast markets and fields of undeveloped resources in the Far East. With the possible exception of Africa and Russia, the producing areas of the world outside of the immediate Orient have all been tapped, but in China, particularly, and in the non-Japanese islands of the Pacific lies the great opportunity of the next generation, a great opportunity because of the fact that a great opportunity occause of the fact that the exploitation of resources will bring com-parative wealth to millions of Orientals who for the first time in the history of the world will become a considerable factor in the

will become a considerable factor in the world's buying markets.

The United States, through the benevolent policy which it has always pursued in the Orient, has acquired a position to profit by this opportunity that is not enjoyed by any other power in the world. American motives

alone are not suspected as imperialistic.

But no matter how great this moral advantage may be, it will avail the American business man nothing unless he makes the most of other and more tangible advantages which are also his.

The Philippine Islands, under the American flag or nominally independent after more than a score of years of American rule, is potentially the strategic base for American commer-cial operations in the Far East, and Manila is already recognized by the far-seeing man of business as the great distributing point for American manufactures in this new field. As these words are being written there

is enroute to Washington a special missis composed of some of the leaders among the Filipino people, both business men and those in public life. They will seek to secure from congress a grant of Philippine independence, but at the same time they will do everything in their power to bring about closer commer-cial relations between the Philippines and the United States

The point that it is essential for the American business man to remember is that no matter what the decision of congress on the political status of the Philippine Islands may be, the opportunities which they offer to him. both in themselves and in their geographic relation to the vast and thickly populated regions that are soon to become centers of production for the entire world and markets for the products of the western nations, will not be changed.



INTERISLAND SAILING VESSELS TRANSFERRING SUGAR TO STEAMER FOR SHIPMENT TO NEW YORK, ILOILO

It is safe to predict that no political changes will be made that do not bring with them guarantees of stability that are more than sufficient, and it is equally certain that the altruistic policies of America in the islands have won for her a willingness on the part of their inhabitants to safeguard and foster the interests of her nationals for all time to come.

The Philippines of tomorrow, equally with the Philippines of today, will be America's trade Gibraltar in the Far East.

That Americans are awakening to this realization has been made manifest in many ways since the beginning of the European war. Port facilities at Manila have suddenly become inadequate to meet the needs of the situation, and the Philippine govern-ment has been forced to extraordinary efforts ment has been forced to extraordinary entorts to keep pace with the growth of our imports. New piers are being designed and before many months are past the port facilities of Manila will be among the finest offered by any shipping center on the Pacific.

Already Manila is becoming the trans-shipment point for American products destined for India, the Straits Settlements, the Dutch possessions, and French Indo-China. A free zone to provide ample attractions and accommodations for the development of this important trade has been proposed and has the support of the government bureau of commerce and industry. That such a zone will be created in the near future seems as-

The advantages which Manila has to offer along these lines are not hard to find. In the first place Manila has direct steamer

service to America, to Europe, to China, to

Japan, to India and the Straits Settlements, to the Dutch Indies and to Australia. In this service American vessels are coming to play a more and more prominent part, and it will not be many months before an American mail line 17-day service between San Francisco and Manila will be realized.

and Mania will or realized.

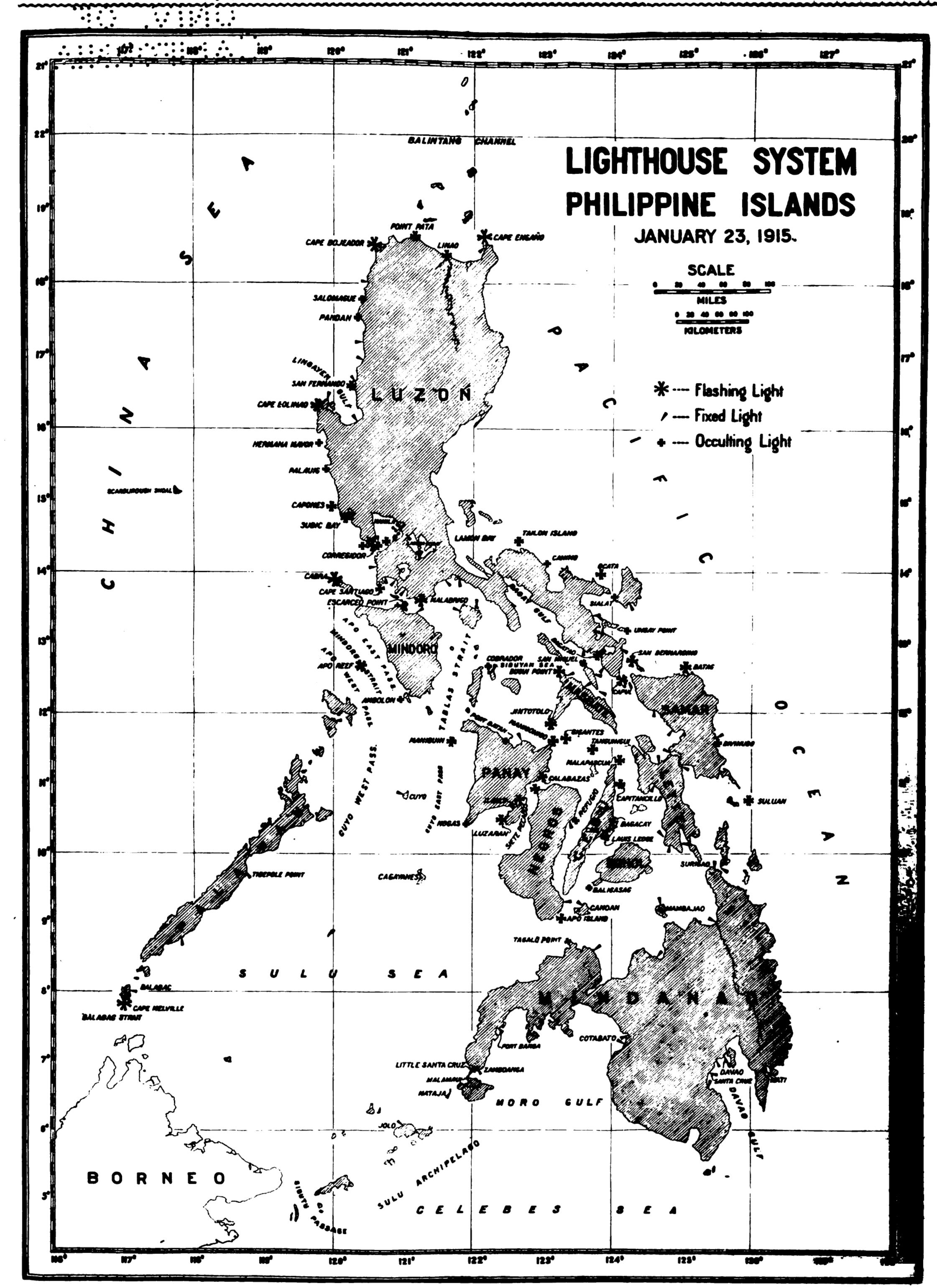
In the second place, Manila has its geographical position. A circle with Manila as its center and with a radius of 1,700 miles, a little over half the distance across the United States, embraces a population of nearly 126,000,000, while a larger circle, with a radius of 3,500 miles, slightly more than the distance from New York to San than the distance of the proposition of the proposition and undeveloped resources of China are practically at the doorstep of the Philippines. ly at the doorstep of the Philippines,

The Malayasias are already trading with America by way of the Pacific, but with a ded out by Walter S. Wheaton, in an article which recently appeared in the Pan Pacific, some of this business, principally that with the British Indies, will return to the Atlantic routes via Suzer \*except such of that business as we can arrange to care for from our first and last American port of call, Manila, which is only 1370 miles northeast of Singapore and is only 1370 miles northeast of Singapore and correspondingly near all Indias and Ma-lavsia countries, and which should be a dis-tributary point for American commerce in that portion of the world. Manila should be warehousing and gateway port, and that

(Concluded on page 108)



PARTIAL VIEW OF MANILA HARBOR AS IT APPEARED AT THE OPENING OF HOSTILITIES, AUGUST 1914



### Taking the Public into our Confidence

From small beginning-a retail Kiosko, almost as unpretentious as a push-cart vender-Walter E. Olsen & Company, cigar merchants, have grown by epochal stages to the largest exclusive tobacco corporation in the Philippine Islands. We came to Manila with the troops in the "Days of the Empire", and it certainly is a pardonable boast that we have kept pace with the evolution of the country. from a disease-ridden land and oppressed Oriental despotism to the present sanitary community and free democracy. For twenty years we have been intimately associated with the Philippine tobacco industry, and we are now in a position to give the public the whole benefit of our varied experience.

Walter E. Olsen & Company is a corporation composed entirely of citzens of the United States of America. By recent purchases in January, 1919, the Company acquired "EL ORIENTE", "'HELIOS", and "LA GIRALDA" cigar factories.

The consolidation of these interests with the original Olsen Company makes the present corporation, the largest cigar manufacturing entity in the Philippine Islands. "EL ORIENTE" and "HELIOS" cigar factories were purchased from the United States Alien Property Custodian at public sales, and LA GIRAL-DA cigar factory at private sale from local interests.

The main factories and warehouses of the company are located in Manila and cover an area of fifteen acres. All of the buildings are constructed along the most sanitary, modern and up-to-date lines, making them the best equipped cigar factories in the Far East. Every operation is conducted under the most rigid sanitary arrangements, and every cigar comes to you as sweet and wholesome as Nature and human ingenuity can make it. You smoke it without misgiving, with keen relish and replete satisfaction, and in the ashes of consumption there remains nothing

but the most pleasant recollection. We confidently come before the public with what we consider to be a super-excellent product—cigars to meet the taste of every smoker, no matter how critical.

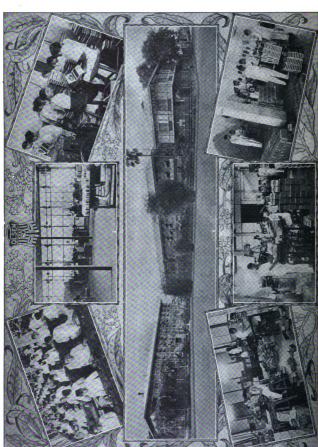
Cagavan and Isabela Provinces constitute the tobacco centers of the Philippine Islands, and it is in this region that the best and choicest Philippine tobacco is grown. It is here that the company owns and operates its own water and land transportation and tobacco packing warehouses, which are built of reinforced concrete, are modern in every respect, and cover an area of sixteen acres. In these warehouses, and in those in Manila, we have tobacco stocks, under-going the process of ageing, of a total value of more than P3,000,000.00. This reserve alone insures and guarantees to the consumer a constant product of high quality and certain value, as the stocks are of the very best, culled from past harvests.

We are not content with having on hand enormous quantities of raw material. We do not permit the matter of haphazard purchase in open markets that are uncertain by reason of crop failures or poor in leaf due to improper seed selection or planting. The company maintains a corps of expert tobacco buyers of many years experience, who keep in close touch with every tobaccoraising section of any consequence. They are constantly moving from district to district, from planting time to harvest, keeping a close record of the growing crops at all stages, and they are thus able, even before the crop is harvested, to locate the choicest tobacco for purchase. We are certain to acquire choice stocks, for our experts are tried tobacco men. who do not guess-they know tobacco, in the growing leaf and in the bale.

With our raw material stocks assured, we turn to our production plants with the confident conviction of certain results. The blending of the tobacco used in our cigars is done by experts employed in our factories for many years, and their knowledge of the qualities of the tobacco grown in the different districts is the result of many years experience. The strictest attention is paid to



Olsen & Co.'s retail Store "Kiosko Habanero" as it Appeared in 1904 Digitized by Gogle



WALTER E. OLSEN & CO., MANILA, PHILIPPINES

Box making department.
 Box-labeling department.

Section of cigar makers room. Corner in cigarette factory.

factory sanitation, to the end that the product that reaches the consumer is an article that is cleanly in the extreme. The total capacity of the company's factories is sixteen million cigars per month—the result of the labor of over seven thousand people.

EL ORIENTE FABRICA DE TABACOS, one of the oldest established cigar factories in the Philippines, was founded in 1883, immediately after the abolishment of the Spanish Government tobacco monopoly. For over thirty-five years, the products of this factory have enjoved an enviable reputation that is second to no other factory in the Philippines. For the greatest portion of this time, it has led all other factories in the exportation of its products to all countries in the Far East as well as Europe, where the "LA PERLA DEL ORIENTE" is a slogan of merit, which you see on every box that leaves this factory, and we guarantee to keep it synonymous with its present status, "The supreme cigar quality and value."

HELIOS CIGAR FACTORY, established in 1890, has been an important factor in contributing to the pleasure of smokers all over the world. It is in the United States, however, the home of critical and discriminate smokers, that the products of this factory have found their largest sale. Over forty-five million cigars a year go to the States to give comfort and solace to lovers of the fragrant weed. This factory did its share during the European War-shipping many millions of cigars to France, where they were very popular among the men who strove to make the world a decent place to live in.

LA GIRALDA CIGAR FACTORY, established in 1888. This factory was amalgamated with the La Comercial, Aguila del Mundo, La Concordia, La Constancia, La Favorita, and La Perla del Sur Factories in the year 1904 and operated under the name of The Philippine Company, Ltd. In 1917 the main factory building was destroyed by fire. On the old factory site, we have erected a new factory building-much larger than the old one-modern and up-to-date in every respect. We specialize in this factory on high grade cigars for the Export Trade. Its products have been particularly well received in the United States by a discriminating public, and orders received from other parts of the world are convincing evidence of the satisfaction with which the public receives this brand.

The products of our factories are sold throughout the world. The epicures of America, Europe and the Far East have continued to purchase our cigars for many years. The ready sale with which our various brands have met is conclusive proof that the products of these factories are acceptable to the demands of the public.

Our factories are open to the inspection of the public. Every detail in the handling of tobacco and manufacture of cigars, from the time the tobacco is received in the bale until the finished product is packed in cases ready for shipment, is gladly shown and fully explained.

### WALTER E. OLSEN & CO.

Manufacturers of

### HIGH GRADE MANILA CIGARS

27 Escolta

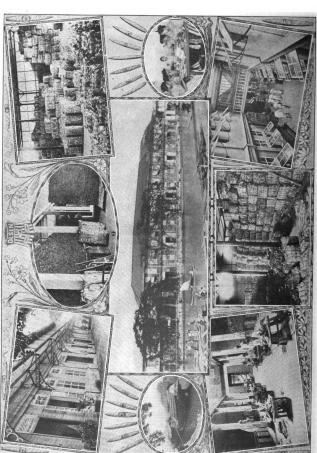
Manila

Philippines



THE OLSEN BUILDING

The first re-enforced concrete building erected in the Philippines, on the site of the "Kiosko Habanero" 1906.



WALTER E. OLSEN & CO., MANILA, PHILIPPINES

4. Casco (river boat) loaded with leaf tobacco 5. One of the leaf tobacco warehouses 6. Wrapping cigars in foll

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### PERFECTOS

Our "Perfecto" is quite different from the product of other factories under this shape. Taking advantage, as we do, of every known science for the production of a perfect cigar, regardless of cost or trouble, we challenge comparison and defy competition. Quality for Quality, with the unprejudiced judge, our "Perfecto" stands without a superior.

The cigars shown on this page represent but a few of the highgrade shapes manufactured by

### EL ORIENTE FABRICA DE TABACOS. MANILA, PHILIPPINES.

The illustrations are reproduced from the actual cigars, and the individual cigars shown are actual size.

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### HEREDERAS DE CORONAS

Manufactured from the highest grade Isabela filler with specially selected light color Sumatra wrapper, insuring finest flavor and burn, they are known to buyers of the best for supreme excellence in quality and workman-





### SUPERBAS

For mildness, the blend of tobacco used in this shape is unapproachable, and yet it has that rare aromatic quality so highly prized in the best grades of Manila cigars. The finest quality of Sumatra leaf is used as wrapper, giving the cigars that light color which is so sought after by the majority of smokers. Of just the right size and shape for discriminating smokers.

### The Philippines-America's Trade Gibraltar in the Far East

(Continued from page 100)

is one of the many things our trades-people will have to do."

"America's opportunities for business with these Far Eastern countries," he continues, "will be immensely bettered if we take advantage of what Manila, as an American 'key port' or base, has to offer, and from which these countries can be supplied."

Among the principal steamship lines now making Manila a regular port of call are the Pacific Mail, the Canadian Pacific, the Toyo Kisen Kaisha, the Nippon Yusen Kaisha, the Osaka Shosen Kaisha, the Blue Funnel line, the Matson line, the Dollar line, the Admiral line, the Java-Pacific Lyn, the China Mail, and the Spanish Mail.

In addition to Manila there are seven ports of entry in the Philippines and three welldeveloped and improved harbors at Cebu, Iloilo and Zamboanga.

At Manila three big piers have been built and two more will soon be under way. The Insular government piers already constructed measure 70 to 600 feet and are largely of reinforced concrete and steel construction. Manila bay is an ideal harbor and the construction of an extensive breakwater has made it doubly safe for shipping. The main harbor is always kept dredged to a depth of 30 feet, and government officials are authority for the statement that this depth may be increased by dredging if necessity requires. The total spent by the insular government in Manila harbor improvements since American occupation up to the end of last year is about **\$7,000,000.** 

Cebu is the second port of the Philippines and has a magnificent natural harbor, on the development of which over a million dollars has thus far been spent.

Iloilo, which is of particular importance as a sugar shipping center, also has a well developed harbor of ample proportions, while the port of Zamboanga is also very well able to accommodate the largest vessels in the Pacific trade.

### Mining Industry

(Continued from page 99)

ordinary conditions is now changed into a losing venture.

It is not in the Philippine Islands alone that gold mining has suffered in consequence of the war. The effects have been worldwide. In the United States many properties, operating on a comparatively small margin of profit but on such a large scale that the total of profits was tremendous, have suspended operations awaiting normal conditions. There is a great deal of discussion over the remedy to be appplied and numerous suggestions have been put forward by operators and legislators. Without reviewing these here it is apparent that the Federal government as well as those of the different mining states are determined not to permit a decline of this important industry. Suitable legislation and liberal treatment by administrative officials seems to be the program on every hand.

Here in the Philippine Islands there has in times past been considerable to complain of on the part of mining operators as to their treatment by the Government. Without rehearsing unpleasant history it may fairly be summarized by stating that this status arose out of overzealousness on the part of certain administrative officials who did not seem to realize the importance—from the Government's standpoint—of developing young industries.

The present government attitude, both legislative and administrative, has all the earmarks of being liberal—a constructive

policy aimed toward building up all lines of industry and particularly those which tend to the development of the natural resources of the country.

With a reasonable period of waiting to permit economic conditions to adjust themselves there seems no good reason why the gold production should not shortly resume its upward march. Undoubtedly the gold deposits of the Islands are widespread. Hardly a stream from whose sands some showings of gold cannot be panned. Only insignificant percentage of the mineral ore has as yet been properly prospected. While there are failures to record in mining operations there are other instances which demonstrate that mining can be carried on profitably.

To summarize briefly what seems to be needed is more capital, with which, properly utilized, to do more thorough prospecting and preliminary development, to install more modern and effective equipment, to tide over temporary backsets, to procure more efficient management and superintendence.

Of the considerable number of mining engineers of prominence who have visited the Islands not one has condemned them but all have insisted on the great necessity of the measures above noted.

This article has been limited to gold mining for the reason that there has been almost no mining development in other branches. However, there are indications of valuable mineral deposits of various kinds throughout the Archipelago.

There are strong showings of petroleum in Tayabas, Cebu and Mindanao.

The indications are that it would pay to develop many of these deposits and the present era of prosperity and development should within the next few years witness a considerable production in several branches of the industry outside of gold mining.

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### The Philippines and the Boxing Game

By Clayton Young.



People in the Unit-ed States, particularly those in the middle west and on the Atlantic Coast where the Philip-pine Islands are seldom heard of and where even their geographic location is often hazily given as "somewhere in the tropics", will probably learn with surprise that not only is Manila one of the best boxingloving towns in the world, but that it boasts besides, a Stadium that surpasses anything ever built for the

same purpose anywhere in America. People who would be apt to put off a trip to Manila because of the belief that they might miss their regular diet of boxing shows, can go ahead, with arrangement for the journes, assured in their own minds, not only that they will be able to take in a boxing show whenever the desire moves them, but that they will be able to see in action, boys who compare, to say the least, most favorably with boxers to be found anywhere else in the world.

At the time this publication went to press, Llew Edwards, featherweight champion of the British Empire and light weight title holder of Australia, was in Manila, and Frank A. Churchill, president of the Olympic Athletic Club, Inc., builders of a P100,000 semi-open Club, Inc., builders of a P100,000 semi-open air stadium which was opened in February, 1919, was carrying on cabled negotiations in the hope of getting Benny Leonard, light-weight champion of the world, to come to Ma-nila and meet Edwards in a bout for the title on the Fourth of July.

on the Fourth of July.

The new Olympic Club Stadium was opened on the night of February 22, with Llew
little Fliphon boxer, appearing in the main
event, Edwards winning the decision. Indicative of the interest that the people of
the Philippine Islands take in the boxing
game is the fact that fully three thousand people were turned away on the opening night, the new Stadium unfortunately having a capacity of but 5,000.

Vince Blackburn, bantamweight champion of Australia, and four other famous Australian and English boxers, with their manager and trainer, George Baillieu, were also in Manila at the time this article was written, all under contract with, and appearing at, the Olympic Club Stadium. The policy of the Olympic Club, under

the personal direc-tion of Frank A. Churchill, of hold-ing two shows a week, means that new boxers are always in demand in the city of Manila.

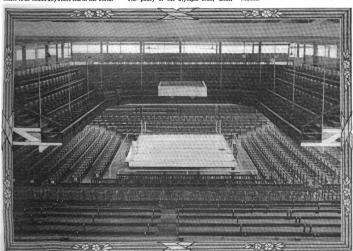
For a number of years most of the American boxers who have made the trip to Manila have been Pacific Coast men. But now, with his new club in operation



and men of the callibre of Llew Edwards and Vince Blackburn in Manila, Churchill has announced that he is anxious to hear from other good men, no matter in what part of the world they may be located.

Boxers or their managers, wishing to arrange bookings with the Olympic Club, should address their correspondence to Frank A. Churchill, Olympic Stadium, Box 421, Manila,

The club's cable address is "Olympac,"



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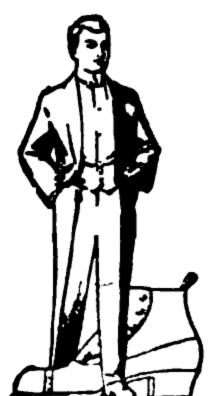
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Over twenty years ago, E. C. McCullough, who came over with the first American Expeditionary forces in the troublous times of 1899, started a little print shop on Calle Cabildo. Since then the business has grown by leaps and bounds, until it has become the largest of its kind not only in Manila, but in the Orient.

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These qualities are equally characteristic of the Electrical Department, which, under the able direction of an Electrical Engineer, has come to be known as the most efficiently operated shop of its kind in the Far East.

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### Railways of Luzon

THEN the good ship "Salvador" dropped anchor on July 8, 1887, off the shores of Manila, her list of passengers included one Carlos E. de Bertodano, C. E., representing "The Manila Railway Company, Ltd." of London, It was his privilege to be the pioneer in Philippine railway construction, in that he was the engineer who blazed the way for the Manila and Dagupan line. After two years of service, ill health prevented his further stay in the islands and on September 3, 1889, Inspecting Engineer Horace L. Higgins became his successor. Mr. Higgins continued in the management and direction of the road until January 8, 1917, when ownership was acquired by the Philippine Government.

Events in both the construction and early operation of the road offer data of historic value to the Philippines. The original franchise for the Manila-Dagupan line was granted by the Spanish Crown, as publicly proclaimed in the official Gazettes of Madrid and Manila on July 17, 1886, and March 24, 1887, respectively. Land for the present Manila terminal was purchased at a unit cost of P0.24 per square meter. Contrasting this with present day prices of P15 and P20 for adjoining property, the rapidity with which real estate values are enhancing may be appreciated. On July 31, 1887, the inauguration of work and laying of the corner stone was marked by impressive ceremonies participated in by His Excellency, Governor General Emilio Terrero, church dignitaries, civil and military authorities, and a concourse of people. The official dress prescribed for the occasion was "Prince Albert coat and silk hat," a requisite that would effectively bar practically every American in the Islands from attending a similar function at the present time.

The entire line of 195,39 kilometers from Manila toDagupan was completed and placed in operation on November 24, 1892, having occupied approximately five and one half years in building. It may be of interest to record a notation in the Company's files to the effect that the native labor of the Philippines was found much more efficient and economical than imported Chinese labor. The estimated cost for the project was P4, 964,400 as against an actual cost of P7.899. 000, or slightly over P40,000 per kilometer. During the period of construction, and for ten years thereafter, all material and supplies used on construction were declared exempt from the payment of customs duties and, as additional government aid, the Philippine treasury guaranteed 8% interest on the investment for two years of the construction

Beginning with 1893 the road was operated for an uneventilul period of five and one-half years. In May 1898, and simultaneous with the destruction of the Spanish Fleet by Admiral Dewey in Manila Bay, the revolutionists destroyed the road at various points and thereby seriously interrupted subsequent operation. In July of the same year the English consul, on behalf of the company's London interests, lodged a formal protest with the

Spanish authorities against further interference with the operation of the road. Relief was denied by the Spanish Governor-General on the ground that to operate the road would in effect "aid and abet the insurgents."

With the American occupation on August 13, 1898, the roadbed was restored and traffic resumed, only to be again interrupted early in February of 1899 when hostilities opened between the American and Filipino forces. The United States Quartermaster Department proceeded to operate that portion of the road falling within the American lines, and as these advanced from time to time the English management moved its offices, first to San Fernando and later to Bautista, keeping well within the insurgent lines. All employees of the road operating within the insurgent lines were given a military status by the revolutionary government, the rank being in keeping with the importance of the position held by each individual employee. Later, however, the revolutionary authorities decreed that only Filipinos be employed in the operation of the road. As a result, Mr. Higgins, managing director, was conducted through the insurgent lines at Calulut and delivered over to the United States military authorities. The other English employees were permitted to embark at Dagupan on a steamer for Ma-

Upon the restoration of peace the railroad management found itself confronted with the task of reconstructing destroyed bridges



CENTRAL STATION. MANILA



PACO STATION, MANILA.

and roadbeds involving a large outlay of money. Also a considerable part of the rolling stock had been wrecked and station buildings burned along the entire line. Of the improvised station buildings some still remain to be constructed. Heavy indemnity claims were filed with the United States Government to cover the damages sustained as a result of the war. These were finally adjusted through the granting of additional franchises and government guarantees that helped to restore the company's financial equilibrium. Following this an extensive construction program was financed and from 1906 to 1913 the company extending its lines both north and south. This activity resulted in the present system of 1,000 kilometers of road now in actual operation. It developed, however, that large sections of the new kilometerage were not highly productive in reveaue, although it is now apparent that this condition will not prevail for long. In view of the rapid economic development of the country, it is safe to predict that practically all of the completed lines will be operating on a dividend-paying basis in the near future.

With the advent of the European war and other adverse conditions the company again found itself financially embarassed and after extensive negotiations the road eventually passed into the hands of the Philippine Government. When the Government acquired ownership in January, 1917, it took over a deficit of one and one-half million pesos. This indebteness has been liquidated to the

extent of over one million pesos through the net earnings of 1917 and 1918.

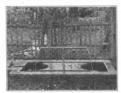
The outstanding stock with a par value of P11,567,000 was purchased by the Philippine Government for P8,000,000. The obligations taken over include a long-term funded debt of P5,3900,000, represented by 4 per cent and 5 per cent bonds and an unfunded debt of P9,127,000, representing Government loans.

The directorate under Government ownership has recognized the necessity for an immediate betterment of the yards, station buildings, and equipment and the necessity for a further extension of its lines as an aid to the economic development of the country. Anumber of the most important station buildings were extensively repaired during the



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past year. Manila terminal facilities were improved through an increase in trackage and the car movement accelerated by more than 45 per cent. A daily passenger express has been inaugurated for both the north and south lines stopping only at the principal stations and affording a means for rapid long distance transit. For the purpose of moving seasonal crops more expeditiously two hundred freight cars and ten locomotives were placed on order early last year involving an expenditure of one and one-half million pesos. Delivery of these is expected during the early part of 1919. With the improvements already made the Company's revenues during 1918 increased more than two and a quarter million pesos over any previous year. A train-messenger express service was installed on all the principal lines with the result that express receipts for 1918 exceeded those for 1917 by 80 per cent, aggregating a total of three quarter million pesos,

Of the contemplated extension projects the one of greatest interest to the general public will no doubt be the elongation of the Legaspi lines to Naga and the main line south to the Guinayangan river. With an auxiliary water line between Passaca and Guinayangan this will offer a twenty-four hour service between Manila and Legaspi and will afford special facilities for the transportation of passengers and express for the Bicol provinces. Plans for financing this project are in the course of realization.

The lines as now operated offer travelers and sightseers an opportunity at a molerate cost and within a limited time to observe at close range practically every phase of provincial life in the tropics. For the northern trip the Baguie Express leaves Manila Station daily at 8.00 a.m. The first important stop is at Malolos, the seat of the first Filipino republic. Enroute the traveler passes first through a densely populated community of small farmers dedicated to the planting of rice. Here the land holdings are so limited in size that no machinery is employed in either the planting or harvesting of the rice crop.

After Malolos the line extends through the heart of Pampanga, a sugar producing province where cane fields are largely in evidence. Modern sugar centrals are projected and in course of construction which will materially increase the already heavy traffic over the company's lines. The extent to which this may develop is best realized when we consider that the Pampanga acreage to the growing of sugar cane actually exceeds the total cane acreage of the Hawaiian group.

Continuing his journey the travler passess through Tarlac and Pangasiana, the granary of the Philippines and the source of the Company's greatest revenue. At Mangaldan the Benguet Auto Line connects with the "express" and lands the travelers in Baguio well before dark. If he chooses however he may continue to the railroad terminal at Baunang and then proceed to Baguio over the scenic Naguilian Road. This course takes him through the tobacco fields of La Union, second only in extent to those of the Cagayan Valley.

Of the branch lines the Cabanatuan extension is by far the most productive in revenue for the Company. This line will eventually extend into the Cagayan Valley thre Nueva Vizcaya. With the construction of the Cabanatuan Branch, the province of Nueva Ecija had an influx of settlers, became second in the production of rice and promises to surpass Pangasian in the near future. Travelers can now make the trip to Cabanatuan without change and return to Manila the same day. In the harvestingofrice modern machiney is here used and extensive areas are cultivated in single tracts making the trip of special interest to tourists.

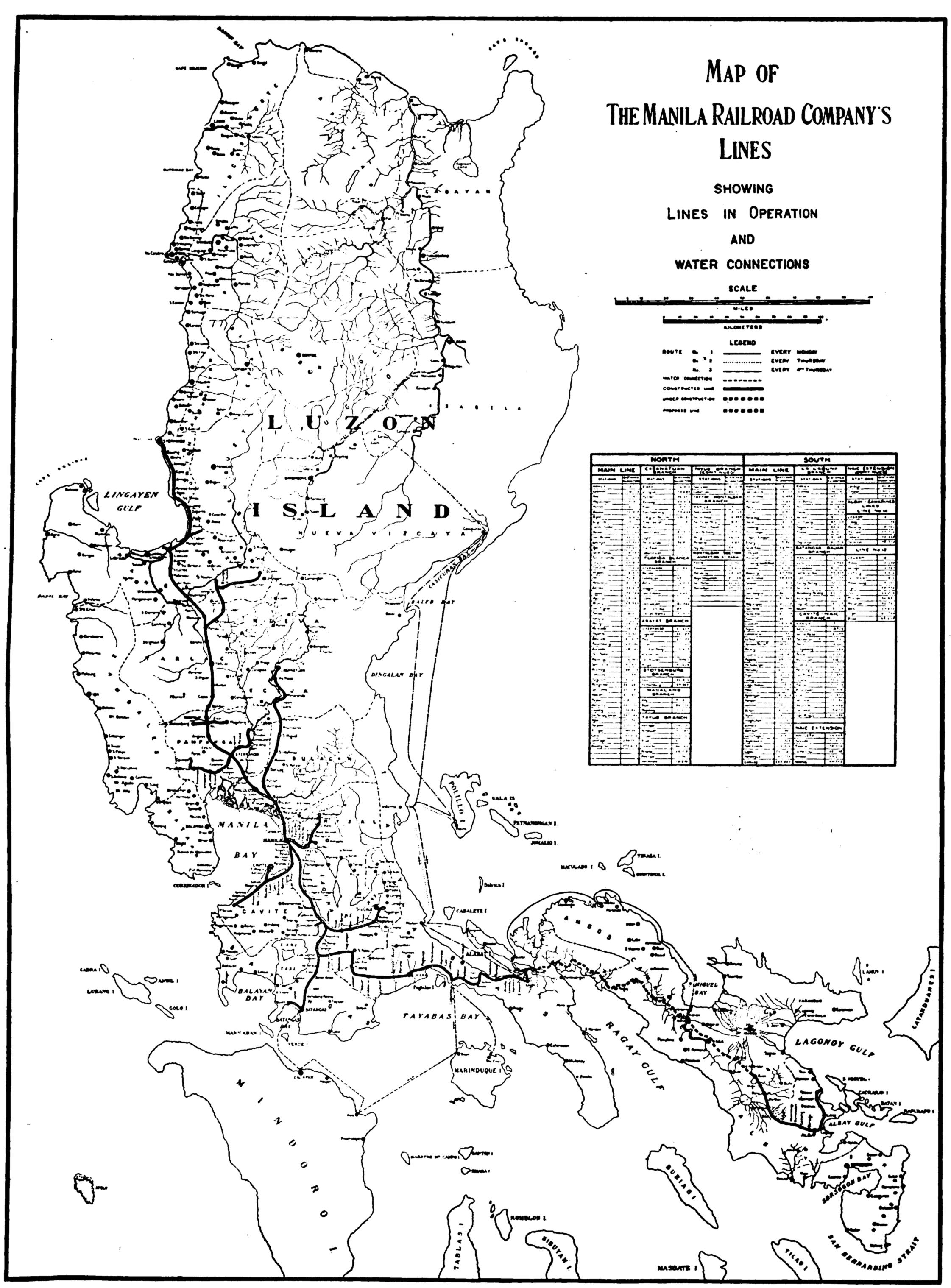
The main line south offers a special attraction for tourists in that the route extends through a veritable econout forest embracing the provinces of Laguna and Tayabas. A daily service is maintained on this run, the "Bicol Express' operating between Manila and Hondagua on the Pacific coast. Connection is made with the Paganajan and Batangas branches, both including points of special interest.

While the southern lines have operated at a loss in past year, results have been more encouraging with each succeeding year and with extensions planned for 1919 and the increasing prosperity of the copra and hemp producing provinces satisfactory returns on the investment are an assured fact.

For the first time in its history the railroad is operating with a substantial financial gain. The Filipino public has been quick to voice its appreciation of the betrements already accomplished under government control and with the keen interest displayed by the legislature in the further extension of improvements the railroad promises to become one of the prime factors in the future development of the country.



MANILA TERMINAL YARDS



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### LA INSULAR FABRICA de TABACOS y CIGARRILLOS, Incorporated

ESTABLISHED BY EXCMO. SR. DON JOAQUIN STA. MARINA IN 1883



### MANILA'S FINEST CIGAR AND CIGARETTE FACTORY

For years we have been manufacturing cigars and cigarettes for the most discriminating smokers. Only the finest leaf from the famous tobacco districts of Isabela and Cagayan Valley are used in our products. \* \* \* \* \* \* \*

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All cigars are subjected to the most careful inspection in our own Factory. All leaf must be in prime condition before worked up. -:- -:- -:- -:-

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### MANUFACTURING

Manufacturing in our plant is done under the most modern sanitary con-ditions. Medical examiners are always present to guard against unhealthy operators. -:- -:- -:- -:- -:-

Sanitary convenience are located in all parts of the factory for use of employees. -:- -:- -:- -:-

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In order that all "LA INSULAR" cigars may reach the smoker in the finest condition without loss of flavor or est condition without loss of navor or fragrance, special care is taken in the packing. You pay for a GOOD cigar and you expect it to meet with your approval. "LA INSULAR" cigars will delight you. -:- -:- -:- -:- -:-

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RECAREDO PANDO MANAGER

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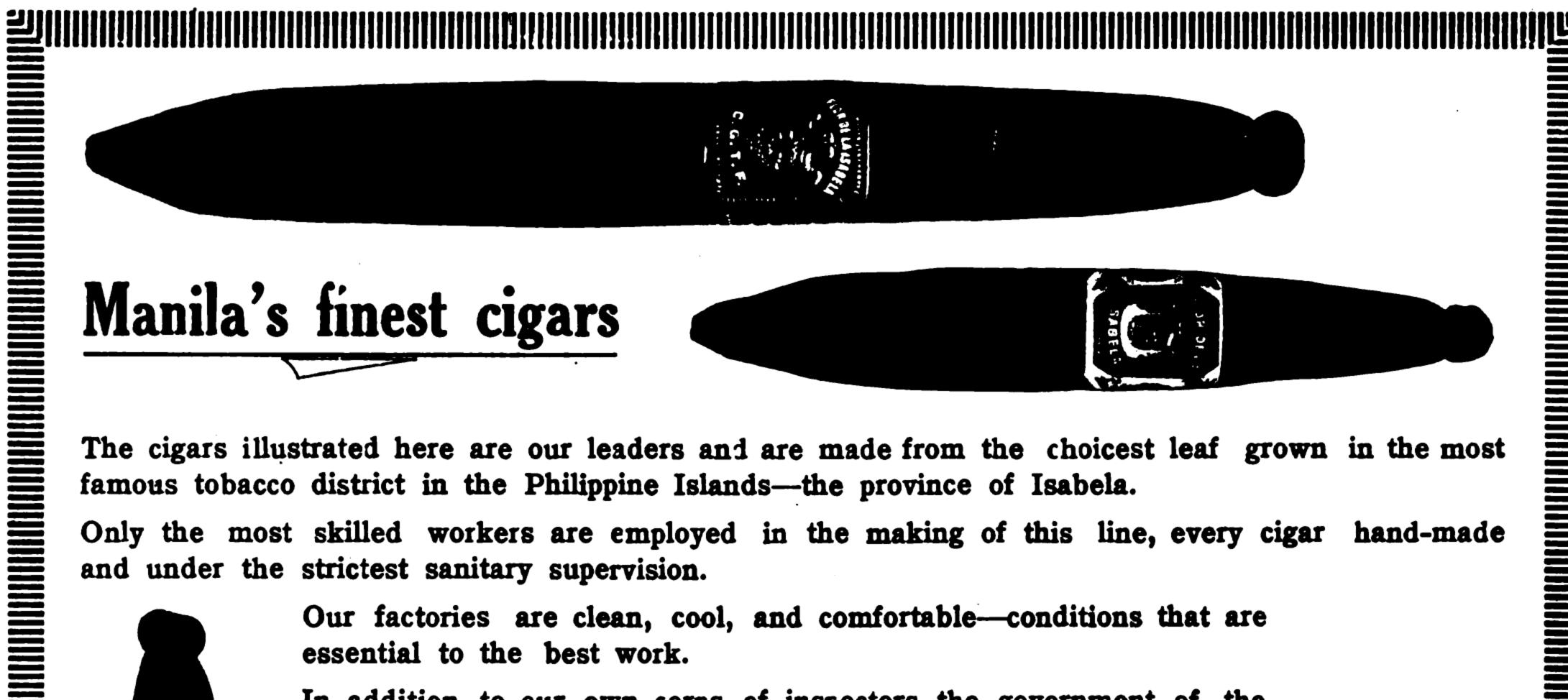
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### The Philippine Vegetable Oil Company

PIONEER IN THE PHILIPPINE COCONUT OIL TRADE

In the old days before the war changed our notions, it was considered droll that an Eakimo should dine on tallow and blubber. When we heard that certain Icelanders could reish a cake of soap without anything to wash it down we laughed considerably. But all this merriment suddenly cased when it was discovered that the world's stomach was crying for fats, and the vegetable oil boom in Manila took its place as one of the world's greatest commercial romancer.

The humble coconut tree, which at one time was good for nothing but confectionery-store sweets, puffed out its chest and stepped forth as a savior of the human race, and the Philippine Vegetable Oil Company, now one of the greatest industries of the islands, embarked in an enterprise, the magnitude of which was not dramed of.

This industry had been developed in the Philippines for five years previous to the World War, but the oil was used mostly for the manufacture of soap, and the fact that this had only the limited use of getting dirt off the features of a few who wished to be without it did not favor the creation of a plant that would cover 110 acres of 1 nd. The idea that this oil, which was good for the manufacture of soap, should also be good to eat was quere, but the world needed fast and copra consisted of from 0.450 not to exceed 5% fat acid.

Another, and more direct demand for the oil contained in copra was the need of gly-cerine for the manufacture of munitions. Copra contained from 8 to 14 per cent gly-cerine, and the result was that glycerine prices on the New York market careened



OFFICE BUILDING

moonward with the boom of the first big gun in Flanders.

Now the only market that the Philippine Vegetable Oil Co. could ever find for their product before the war was in Marseilles, France, and here was an American market for the first time.

So the directors of the Manila copra concern tent and got an engineer and told him to get up some plans that would provide for a million dollar plant or a two million dollar plant or something like that. It made no particular difference how much the way for the way to the control of the cont

so the arcintect nurries.

New machinery was ordered from the
States in large quantities and the company
placed agents throughout the Philippine
Islands with orders to buy everything that
looked like a cocoanut. Additional ground
was secured at the plant of the company in

Santa Mesa and preparations were made on a large scale to get vegetable oil to the market with the least possible delay.

The plant grew like a mushroom. The old method of shipping oil in drums and barrels was discarded, and the company prepared to pump the oil directly into oil barges and from these to tank steamers in the bay. The matter of getting the oil barges up to the plant on the Pasig river seemed troublesome, so the company managed to get hold of machinery to equip a dredge, and this was set to work in the shallow places of the river channel just below the plant.

One day it suddenly occurred to the engineer in charge of the construction of the plant, that something might go wrong with the city power plant some day, and it gave him a cold chill to think of the possibility that the big grinders and cookers and expellers and filters might lie idle for want of electricity.



RIVERSIDE VIEW OF WAREHOUSES AND FACTORY



ENTRANCE TO FACTORY

"Got to have our own power plant," said he. "Can't be dependent on somebody else for our juice when we begin having tons of coora coming in here every day?".

Big generators were 'ordered from the States and were installed on their arrival in a huge building that had been made ready for them. And it was along lines of completeness and independence that the big plant grew until, at the present day, everything it needs for the handling and transport of its product is its own, from the engines, that puff up and down in the vards delivering cars of copra, to the very ships and tank cars that deliver bulk oil to the buyer in the United States.

And it was not long before those tank cars were delivering bulk oil in quantities, although not in the quantities that were required. From soap factories it went to manufacturers of cocoa-butter and from those to salad-oil manufacturers and from these it found is way into glucose factories and on up the scale until it had filled wants that had been undersamed of. It was needed for its glycerine in the making of munitions and then the

cake became the basis of the most scientific cattle feed in the world and then they began to utilize it as fertilizer with astonishing results, and still there was no end to the demand for the stuff.

Following the first great demand for the vegetable oil there were dozens of factories started in Manila, but many of these, because of their lack of the independent production features that were incorporated into the P. V. O. from its inception, found it hard to compete when the price of the raw material rose high on account of the increasing demand for it. The P. V. O. was prepared for this contingency, however, and the perfection of its plant, which had been designed for this very eventuality, was equal to the

The result is that the P. V. O. is still growing by leaps and bounds while many of the smaller competitors have dropped by the wayside.

For a nine-year-old infant-industry the Philippine Vegetable Oil Co. is the huskieshlooking outfit that Manila possesses. It covers 110 acres of land and its huge buildings can be spotted from any vantage point of the citv. Its great administrative build-



COCONUT GROVE IN LAGUNA PROVINCE



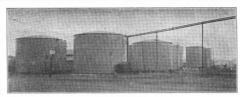
ing raises its head high above the surrounding district and is imposing in Philippine architecture and hard-wood workmanship.

The company has agents scattered to the four winds wherever there are cocoanut trees and these buy and ship to Manila all the copra that can be handled. The heart of the cocoanut district is in San Pablo, Laguna, which is about 90 kilometers distant from the city and a beautiful sight from the road which winds up and up from the meas. So vast and unbroken a field of the trees is hard to find anywhere in the tropics, and as the breeze bends the heavy fronds of the plants all in one direction, it might be the waving tresses of some dark maiden of the tropics streaming over the crest of the mountains and reaching to the valley.

When the copra reaches the factory in sacks and is sent to the grinders by a system of endless chains, it has been "touched by human hands" for the last time. When, after passing through the cookers, then to the there for its last refining, it is pumped into the oil river barges, pumped into the tanks of the company's steamers, and pumped either to the company's storage tanks in its United States properties or into the company's tank cars for shipment to manufacturers of the States.

This new system saves a tremendous amount of labor which was performed in the days when the oil was barreled. The company still maintains its own barrel factory on a small scale for the storage of the oil for Philippine consumption. The daily capacity is 163 tons and it is self-bit that the capacity had not been reached during the last four years.

Another small adjunct of the plant is a soap factory which does not pretend to go outside of the islands for its trade. This soap is handled by an English house in Manila. Foundries, machine shops, power plant and even the eating house for the employees



STORAGE TANKS



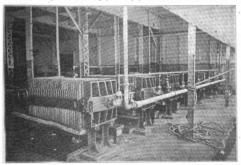
WAREHOUSE

are located on the premises in order that it will not be necessary to depend on outside plants for anything.

At different times of the year the company employs more than 1,000 men in its Manila plant alone, and these, for purposes of convenience and facility as well as economy, are fed in the company's huge dining pavilino. An abundance of wholesome food is furnished to the employees without cost, which, to the workers, is one of the attractive features about being employed there.

The visitor who makes a four of inspection over the plant is not surprised at the huge total of the yearly exports of the company. When he sees an array of 24 great steel tanks with a capacity of 10,000 tons of oil, see engines steaming up and down the yards handling the company's own cars and placing them in positions for unloading, glimpses long rows of warehouses and a dozen great buildings he can readily believe that he is viewing one of the greatest establishments of the kind in the world. The power plant generates 3,800 amperes of electricity and this current operates all the machinery and lights of the whole establishment.

A chemical laboratory was established several years ago in connection with the plant with the intention of making a research of the possible by-products of copra. Some progress was made in this line, but the -urgent demand for the vegetable oil precluded for the time being all other considerations.



FILTER ROOM



MACHINE SHOPS AND FOUNDRY WORKERS

This will no doubt be resumed at an early date in order that the cocoanut may yield to science even greater treasures than those supplied by the fast acid and the glycerine.

At present the refuse of the copra is utilized as fertilizer and makes an excellent cattle feed

For both of these purposes the product is sent out in the form of cake, and, used in conjunction with feed of other varieties, it has been found to possess fattening qualities superior to any other cake. The chemical laboratory of the plant, how-

ever, continues daily activities, not only in the analysis and perfection of the oil, but in forward-looking oil enterprises that have not as yet been scratched. Every nut that grows in the Philippines possesses peculiar qualities which hold out great promise of commercial treatment. In a room adjoining the well equipped chemical laboratory are piles of nuts of the old contrivance whe ein a carabou walked around a mill which was constructed of heavy stones. This method is in use at the p esent day for p oduction of certain oils on a small scale, and when the P. V. O. people enter the field methods of production will see a great revolution.

Much of the present machinery of the mill can be utilized for the production of other oils and there is no doubt of the demand for them. The present difficulty is with the securing of laborers to bring in the nuts. This, on account of the difference in the way they g ow from the cocoanut plant, has interfered with gathering them on a large enough scale to justify extensive additions to the plant. It is certain, however, that some method will be devised for securing the nuts in proper quantities.

Principal among the nuts that promise to further enrich the Philippines is the Lumbang. nut, which, it has been ascertained, contains the basis of high-grade varnishes. This has a valuable market in the United States. The oil from this nut is also the basis of many quick drying polishes for which manufacturers of hard-wood furniture have an active demand. The nut is very much smaller than a cocoanut and therefore the labor of gathering it presents the same relation to the labor of gathering cocoanuts that the gathering of coffee-beans has to the harvesting of pineapples.



YOUNG COCONUT PALM IN FIRST YEARS



DRIERS AND COOKERS

of every description, which are being experimented with for the purpose of ascertaining their commercial values. The activities of the P. V. O. will be enlarged to include the production of several other important oils within the next year and the foundations of this work are being laid now.

As far back as the oldest Filipino can remember the people have used oil extracted from nuts for illumination. This oil was secured by Chinese, principally, who made use

The Philippine Vegetable Oil Company has done much during the past three years to stimulate the planting of castor beans and it is certain that the production of castor oil will develop into an important industry and will in the future rank as one of the leading exports of the Islands. Naturally the development will be slow as the farmers have never cultivated the castor bean and must learn how to take advantage of the best methods of culture and of harvesting the beans.

## Edward Chesley

UNCROWNED KING OF THE INFANT OIL INDUSTRY

In these ripping democratic days when it is customary for crowned heads to gather up their doll rags and hide themselves to some secluded spot far from the haunts of man, Edward Chesley would not give any-body his heartfelt thanks to call him the oil king of the Philippines.

king of the ramppines. To call him a master electrician to a successful inventor or even an organizing genius, but if anybody should offer Chesley a crown because of his success in the cocoanut of business during the past two years they would have as poor lock as to induce Caesar to decorate himself with a golden hat in the market place in Rome.

"No king stuff for me," Chesley would say with modesty and decision. "I merely was lucky in knowing something about oil machinery at the moment when oil machinery was the most important thing in the world

outside of big caliber guns!

And so, for want of an appropriate honorary title to bestow on the most prosperous oil man in the Philippines, we will simply relate some of the remarkable things this clever man has accomplished since gushers of vegetable oil were located in the Philippine cocount groves and men were running hystereforts to devise a way to box it or bottle it or put it up in parcels of any kind to get it to the United States where they needed it.

Six years ago Chesley was an electrician in the navy located at Cavite and they say that anybody at all could have a chew from his plug of tobacco, for the asking. Knocked around the place in overalls with a pair of pliers showed into his hip pocket and pieces of insulation sticking to his raiment here and there; and he didn't have any more came. When it came to the settling of those little fifteen cent affairs on pay-day he was in the thick of it. He could always shake a guy down for six bits or whatever it was because he always paid it back strictly on time, and there you have one of the secrets of the coll business began to hum.

With no intumation that any introspective will response to the coll business began to hum.

With no intimation that any introspective mind might have that this man was to some day be in danger of coronation as an oil magnate when he went over to the Philippine Vegetable Oil Co., then the first plant of the kind in Manila, to help install the machinery

he being at that time a mechanic and electrician of no small note.

cast of no straint water his case the material the instant of the material that ma

It was here that the ability of this commonplace individual to make a machine carn its pay was manifested in the most striking instances. The expellers which were then in use were wont to do about as they pleased and Chesley could see that production was lagging because of technical deficiencies in these machines. He worked on the blamed things and fussed with them night and day, fitting new parts\_into them that he\_make



himself in the machine shops. He ate his lunches beside an expeller and, figuratively, he took an expeller to bed with him at night until he knew all of its fault and where they could be remedied.

Every expeller in use in the Philippines at the present time embraces his inventions and improvements and production at the Visayan was nearly doubled by means of a few little simple ideas that Chesley had put into action.

Then he came to Manila and established a mill of his own. This was a new sort of thing for him. He could sit down and reason with a piece of machinery until it would do what he wanted it to do, but the task of making people with capital see his schemes was another sort of game, and, to tell the an aman with half an eye could see the logic of his plan for a mill that would give a maximum of production for a minimum of expense, and there were two men in Manila who had a half an eye and then some.

The Chesley, Conde Co., in which Chesley had one-third interest, was the result of Chesley's maiden effort at financiering, and within a year each of the partners to the concern had cleared more than a million and on the strength of this success they bit off a little more and chewed it too. The Chesley, Conde Co. increased its copulatation and capital of four millions, with the unassuming man in the greasy overalls at its head.

No matter what the manners of the times permit us to dub this man, he certainly, from that time on, had a finger in all the oil affairs

that were worth it. He dipped into the Philippine Archipelago Oil Co. and when it sold for Pl. 200,000 to Carl W. Hamilton it had not on much as turned a wheel. This property is now known as the Rizal Refining Co. and the organization that Chesley put into it toggin as a large part of the success it as a large part of the success it and the organization that the success it are the success i

Hamilton at the same time bought the Holland American Oil Co. now called the Philippine Refining Co. and Chesley's fingers were in both of the Hamilton enterprises to the extent of one quarter stock.

So this man who had once gone among his friends in guest of "two bits fill pay day" at Cayles outle watch mechanic and his dollars working for him to the tune of hundreds of thousands per year. A dozen men were waxing wealthy through methods which had been perfected just at the right moment by Edward Cheeley and nobody begrudged the returns he was receiving for his own part in the great oil adventure.

There are very few lists of donations for the many causes that the war has brought reforward which do not display the name of the former humble electrician up close to the opp with figures opposite that would scare a person. He is sponsor for all sorts of charities and government boans and his philanthropies cover the city of Manila.

As assistant to the president of the Rizal and Philippine Refining Company he has his hands full and he is constantly at work on some technical mechanical point that will contribute to the greatest boom industry that the Philippines have ever witnessed.

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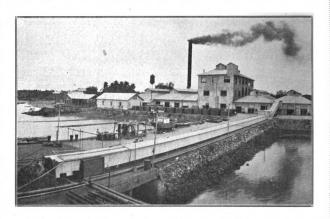
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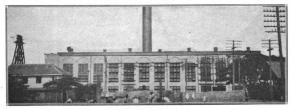
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